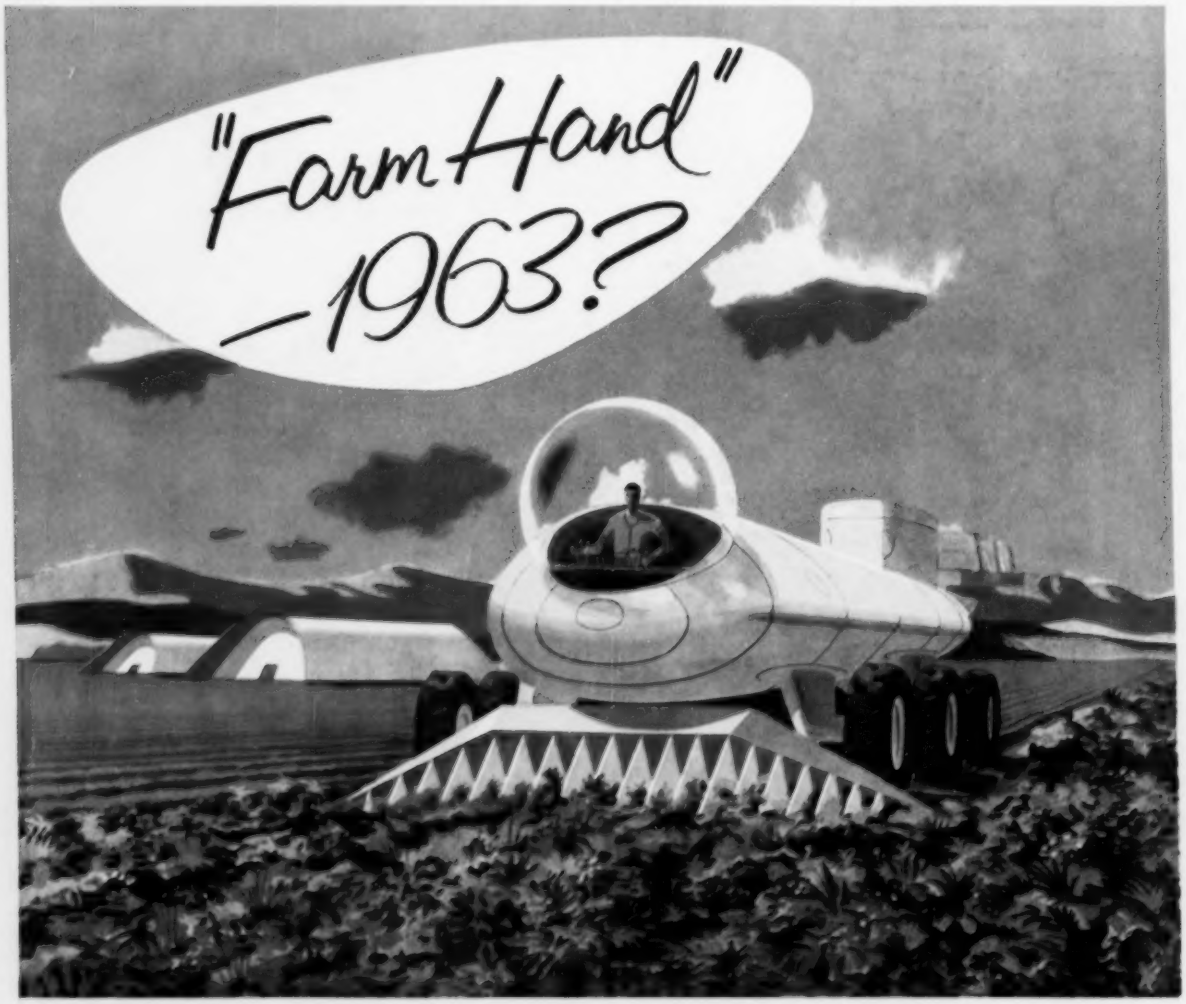
the Iron Age
A Chilton Publication
THE NATIONAL METALWORKING WEEKLY • JUNE 9, 1955

How does booming business affect purchasing?
See page 35



NEW DEPARTURES OF TOMORROW

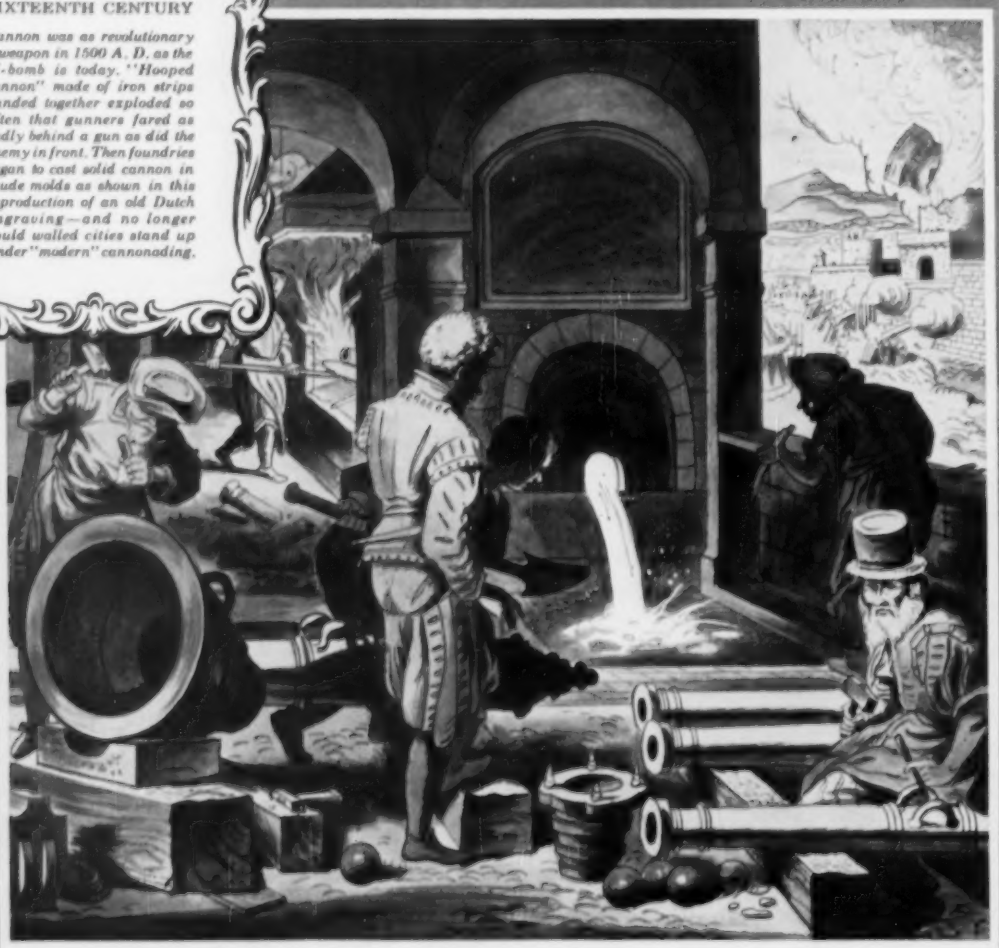
Today, New Departures are used by almost every manufacturer of farm equipment. That's because New Departure ball bearings have proved their ability to carry all loads, preserve accurate alignment of moving parts, cut friction and upkeep.

How you gonna keep 'em *away* from the farm after they've seen this machine? . . . Chances are, the people who develop this **soil-conditioner, fertilizer-planter unit,** with its air-conditioned control cab, will call on New Departure for ball bearings. Maybe they'll just need New Departures that are already in world-wide use—like the Sealed-for-Life or the double-row angular-contact ball bearings. Or they might want an entirely new type—a "new departure" in ball bearing design. Either way, New Departure is the answer. Manufacturers everywhere know that New Departure always lives up to its name—being *first* with the finest in ball bearings.

NEW DEPARTURE
DIVISION OF GENERAL MOTORS • BRISTOL, CONNECTICUT

CANNON FOUNDRY
SIXTEENTH CENTURY

Cannon was as revolutionary a weapon in 1500 A. D. as the H-bomb is today. "Hooped cannon" made of iron strips banded together exploded so often that gunners fared as badly behind a gun as did the enemy in front. Then foundries began to cast solid cannon in crude molds as shown in this reproduction of an old Dutch engraving—and no longer could walled cities stand up under "modern" cannonading.



Crafts and craftsmen through the ages

NUMBER FIVE OF A SERIES

Basic Refractories not only furnishes its customers with the finest refractories available, but also employs skilled craftsmen —men with practical steelmaking experience— to insure that the use of these products gives full value.

BASIC REFRACTORIES INCORPORATED CLEVELAND 15 OHIO

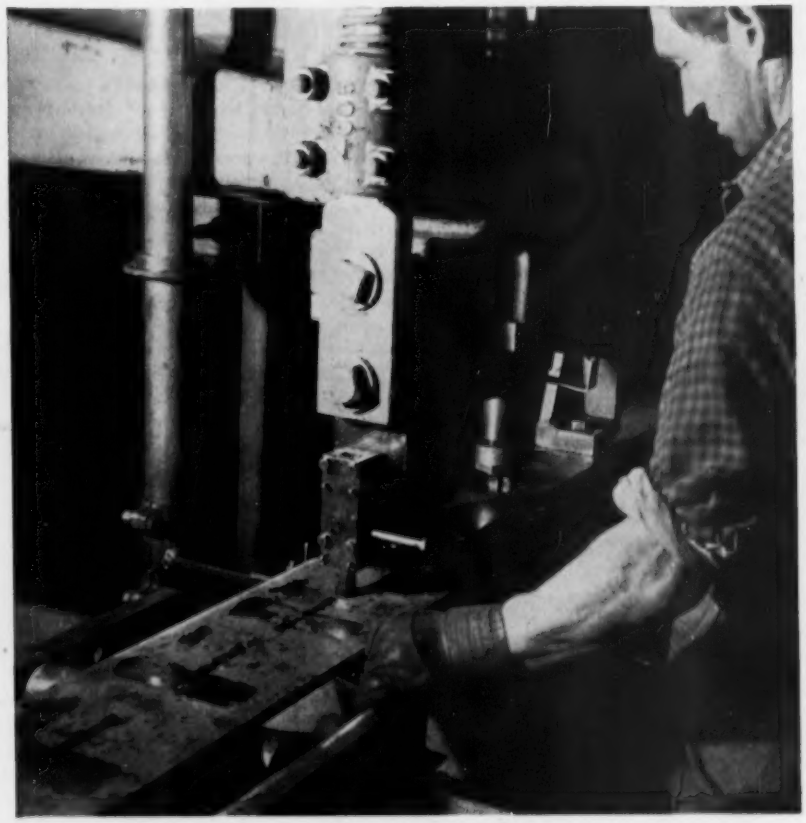
REFRACTORIES ENGINEERING AND SUPPLIES, LTD.—EXCLUSIVE CANADIAN AGENTS

Tool Steel Topics

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

Export Distributor: Bethlehem Steel Export Corporation



This Bearcat punch (shown above man's wrist) punches 15 square holes in each ½-in. steel plate, used as cutting edge of snow plows. Average life of punch is 5500 holes, with only three light redressings.

See What They Gained by Switching to Bearcat!

One of the operations performed in the shops of Frink Sno-Plows, Inc., Clayton, N. Y., is punching 15 holes, 11/16 in. square, in a carbon-steel plate. The plate, ½-in. thick, is used as the cutting edge of highway snow plows. With grades of steel previously used in this punching operation, the service life of each punch varied considerably—anywhere from 300 to 1500 holes.

We felt confident that Bearcat tool steel could do better, and they agreed to give it a trial.

So Bearcat was put to work, with the punch hardened to Rockwell C56-57. Production went up immediately. Now the life of each punch is approximately 5500 holes, with only light redressing of the corners required every 1500 holes or so.

Bearcat is a tough, general-purpose air-hardening tool steel. When used in punches, its chief advantages are exceptional resistance to shock, and superior resistance to wear. Besides, Bearcat's air-hardening characteristic minimizes quenching hazards, and provides good resistance to distortion in heat-treatment.

In addition to punches, there are many other applications where Bearcat can be used to advantage: rivet sets, for example, and chisels, gripper dies, hot headers, master hobs and die-casting die inserts, to name only a few.

Why not learn for yourself how good a tool steel Bearcat really is! You can order it right now through your Bethlehem tool steel distributor. It can also be obtained from our well-stocked mill depot.

BETHLEHEM TOOL STEEL ENGINEER SAYS:

Switching Grades Won't Cure Tool Troubles

Granted that quality is of primary importance in tool steel. But there are four other factors which are also essential to the satisfactory performance of tools: (1) good design, (2) correct heat-treatment, (3) proper grinding, and (4) proper application and mechanical use of the tool.

Ordinarily a manufacturer's responsibility lies only in quality. Yet if results are unsatisfactory the user often concludes that "the steel is no good," whereas any of the other factors mentioned may be the real culprit. That is why it is so important to investigate all five of these factors. For they are like links in a chain; unless they are in reasonably good balance, trouble can be expected. When this happens, the tool and its work must be investigated thoroughly before a remedy can be suggested.

In the majority of cases, switching grades is not the answer in attempts to cure trouble with tools, for the difficulty usually lies elsewhere. Before switching grades, the user should first have a clear-cut reason for doing so, and definite objective. Otherwise, the original trouble may be intensified, rather than removed.

BETHLEHEM HOLLOW-BAR SAVES TIME IN RING-TYPE APPLICATIONS

If you work with ring dies, draw rings, or hardened bushings, you can save time by using Bethlehem Hollow-Bar Tool Steel, either in BTR (oil-hardening) or Lehigh H (high-carbon, high-chrome). Hollow-Bar is made by high-speed trepanning. By this process, hammer-forged or hot-rolled bars are cored out, and are then rough-turned on the outside. With Hollow-Bar, there's no need to wait for forged rings or discs.

the Iron Age

Vol. 175, No. 23 June 9, 1955

DIGEST OF THE WEEK

Starred items are digested at the right

EDITORIAL

Does Your Customer Like You? 7

NEWS OF INDUSTRY

*Special Report: Boom Bothers Buyers 35
*Labor: Reuther Wins on GAW 37
*Raw Materials: Dredging Starts Ore Project.. 39
*Distribution: More Metal Travels By Air..... 40
*Marketing: Appliances Claim More Steel 42
*Financial: Stock Market Meets the Public..... 43
*Manufacturing: Computor Aids Machining.... 44
Industrial Briefs 50
Personnel: Iron Age Salutes 65
Iron Age Introduces 67
Clearing House 154

NEWS ANALYSIS

Newsfront 33
Report to Management 49
Automotive Assembly Line 52
This Week in Washington 57
West Coast Report 61
*Machine Tool High Spots 63

TECHNICAL ARTICLES

*New Plating Machine Has Job Shop Flexibility. 75
*Die Design Solves Production Problems 78
Grinding Improvements Boost Output 81
*Combine Standard, Special Tools Efficiently .. 82
*Equip New Merchant Bar Mill for Versatility .. 85
*Mechanized Welding Assures Uniform Quality. 88
New Wick Material Conserves Bearing Oil... 90
Technical Briefs 112

MARKETS & PRICES

*The Iron Age Summary—Steel Outlook 131
*Steel Product Markets 132
Comparison of Prices 133
Iron and Steel Scrap Markets 134
*Nonferrous Markets 138
Steel Prices 141

REGULAR DEPARTMENTS

Dear Editor 9
Fatigue Cracks 11
Dates to Remember 13
Free Literature 92
New Equipment 123

INDEX OF ADVERTISERS..... 160

Copyright 1955, by Chilton Co. (Inc.)

THE IRON AGE, published every Thursday, with an additional issue in June, by CHILTON CO. (INC.), Chestnut & 56th Sts., Philadelphia 39, Pa. Entered as second class matter, Nov. 8, 1938, at the Post Office at Philadelphia under the act of March 3, 1879. Price to the metalworking industries only, or to people actively engaged therein, $5 for 1 year, $8 for 2 years in the United States, its territories and Canada. All others $15 for 1 year; other Western Hemisphere countries, $15; other Foreign Countries, $25 per year. Single copies, 50¢. Annual Review Issue, $2.00. Cables: "Ironage," N. Y.

Address mail to 100 E. 42 St., N. Y. 17, N. Y.

NEWS DEVELOPMENTS

PURCHASING AGENTS FACE BOOM PROBLEMS—P. 35
Though purchasing agents are happy about the current high level of business, they are faced with many problems resulting from it. Shortages, higher prices, government stockpiling and stepped up production demand are factors they have to deal with.

FORD REACHES SETTLEMENT WITH UNION — P. 37
Walter Reuther's United Auto Workers has won a guaranteed semi-annual wage from Ford Motor Co. The agreement sets a pattern for giant General Motors and other car producers as well as other industry. For the first time in history, the principle of wage payments for workers laid off from their jobs has been established.

INLAND'S ORE DREDGING PROJECT BEGINS — P. 39
Inland Steel Co. has started a five-year dredging project in an Ontario lake as a preliminary to mining of ore at Steep Rock. Dredges and pumps will work night and day throughout the year. Shipment of ore will start in 1960 upon completion of railroad.

PUBLIC LEARNS ABOUT STOCK MARKET — P. 43
How-to-invest show takes public behind scenes in Wall Street. Stock Exchange and industry show how buying a share in industry shows long term profits. More than 6.5 million own stock today. Exhibits tell who should enter the market, who can't afford to.

NEW COMPUTOR SOLVES MACHINING PROBLEMS—P. 44
Considering 19 machining variables, GE's new electronic computor figures tool life for different machining conditions, enables shop people to determine best combination for long tool service. Unit solves special machine problems, can be run by untrained men.

KAISER PLANS MORE ALUMINUM WORKS — P. 57
Company looks for record shipments this year, plans more capacity for hungry consumers. West Coast needs more power by 1960 when a shortage is forecast. Area now produces 35 pct of nation's primary aluminum.

TEST MEASURES MACHINE TOOL PROGRESS — P. 63
How much better are today's machine tools than those of 10 years ago? To answer this question a test was run on two milling machines, one new, one a 1945 model. It was no contest. New unit doubled the output of the oldtimer. The test showed that design changes have brought important performance improvements.

IN METALWORKING

ENGINEERING & PRODUCTION

AUTOMATIC PLATER HAS JOB SHOP FLEXIBILITY—P. 75
High production and efficiency were the chief objectives in getting an automatic machine to plate tubular furniture components. In terms of manhours, it is producing 14 times as much as by previous methods—and this rate can be stepped up. Yet, its design is flexible enough to be converted easily for other production. It can be used with two or more processes.

DIE DESIGN SOLVES STAMPING PROBLEMS — P. 78
Small stamped parts made from thin stock and with closely spaced holes often present special production problems. Good design can simplify both the making and operation of dies for such parts. The result is higher production at considerably lower cost.

MACHINES TEAMED FOR MAXIMUM EFFICIENCY—P. 82
Both general purpose and special machine tools have a place in modern mass production. Westinghouse combines both types for utmost efficiency and economy at its air conditioner plant. First, it gets the best equipment for any machining job. Automatic controls boost output and quality. Careful grouping cuts handling.

EQUIP NEW BAR MILL FOR VERSATILITY — P. 85
Operators of a new merchant bar mill are confident of increasing original output ratings. Staggered roll stands combine "cross country" versatility with the rapid travel of a single or double strand repeater operation. Y tables use sweep arms instead of skew rollers to traverse and control bars for entry into successive roll stands. Spare stands are kept ready for a 45-minute mill changeover.

MECHANIZED LINE ASSURES UNIFORM WELDING—P. 88
To obtain consistent quality in joining compressor housings to covers, York Corp. does its welding on a high speed line. Conveyors carry parts through cleaning, welding and testing cycles.

MARKETS & PRICES

MORE METAL IS MOVING BY AIR FREIGHT — P. 40
Air freight business in the early part of this year was running 25 pct over last year. Many firms are willing to pay higher costs for quick delivery. But due to stiff competition air freight has improved markedly in the last few years and in some instances air shipments cost little more than rail or truck deliveries. Air freight helps cut rejects, eases field inventory problem, reduces packaging costs.

APPLIANCES KEEP PRESSING FOR STEEL — P. 42
There is little danger of appliance steel buyers overloading on steel purchases. Sales are good and retail inventories are not high. Most steel products are extremely tight for buyers and warehouse sources are being used. Sales are up as much as 40 pct.

AUTO SETTLEMENT TIGHTENS STEEL — P. 131
Ford settlement removes one big hazard in steel boom. It also means steel labor will be tougher in negotiations. Fourth quarter steel production may now set all-time high. Heat for deliveries will come from all sides. Steel labor wage settlement will be closer to 15¢ per hour than 10¢ as first predicted. Auto settlement at close to 20¢ package strengthens labor's hand. Issues are limited to wages.

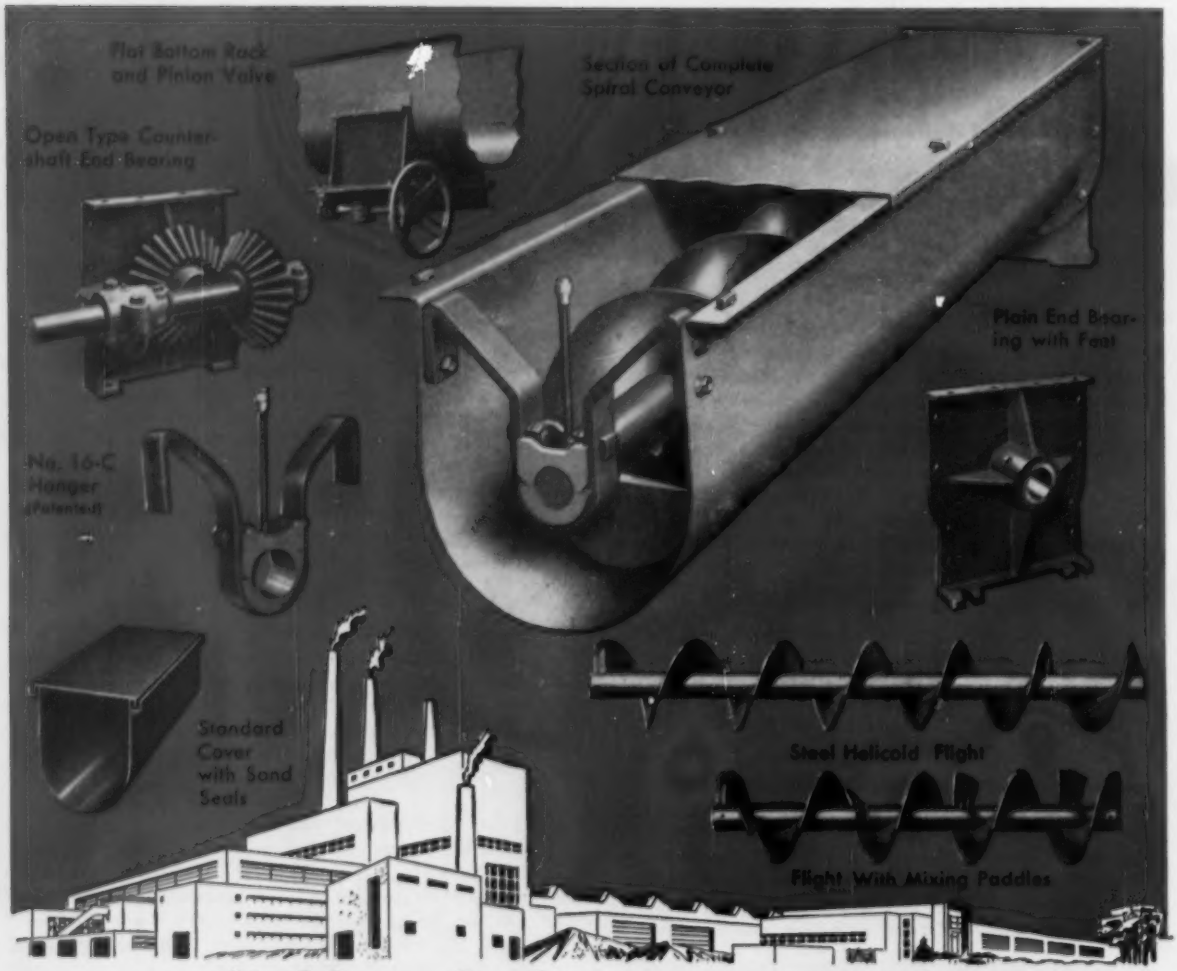
SHEET DEMAND CONTINUES AT HIGH LEVEL — P. 132
Despite some reported "cutbacks" in sheet orders by automakers, "cancellations" are described as minor adjustments by steel sales executives. Other consumers pick up the slack immediately. Plates, structurals continue to lead steel products parade.

AUTO PEACE PUTS HEAT ON NONFERROUS — P. 138
Like almost everyone else, producers and users of nonferrous metals anxiously awaited outcome of the auto confabs. Peaceful settlement was seen as bringing stepped up demand for some metals.

NEXT WEEK:

IMPROVE THE QUALITY OF DEEP DRAWING STEELS
Strain aging is a major problem in deep drawing operations. It results in "stretcher strains" which mar appearance. Some aged materials even tear in the press. A vanadium addition can prevent "stretcher strain" in deep drawing sheet. Careful processing of stabilized material does away with temper rolling.

WHAT ARE FUTURE MARKETS FOR STAINLESS?
Stainless steel producers are enjoying what may be their best year in history. But they are still looking ahead to future applications for their products. They foresee growing use of stainless in the home, in architecture, in gas turbines for autos, in aircraft, on the farm, and in atomic energy. The future looks good.


Flat Bottom Rack and Pinion Valve
Section of Complete Spiral Conveyor
Open Type Countershaft End Bearing
Plain End Bearing with Feet
No. 16-C Hanger (Patented)
Standard Cover with Sand Seals
Steel Helicoid Flight
Flight With Mixing Paddles

reliable spiral conveyor performance with JEFFREY INTERCHANGEABLE PARTS

"Down time" on a spiral conveyor costs you time and money. To help you lower both these expenses, Jeffrey maintains a healthy inventory of spiral conveyor flights, end and thrust bearings, hangers, covers, discharge openings, spouts, valves and other replacement parts.

A letter or phone call to our Merchandise Sales Division in Columbus or your nearest Jeffrey District Office or Jeffrey Distributor will get quick action. Immediate shipment of reliable Jeffrey interchangeable parts will put your spiral conveyor unit back in operation on the double. Better yet, don't wait for breakdowns, order a supply of essential Jeffrey replacements now.

Jeffrey builds all spiral conveyor components on equipment designed especially for that purpose. Uniform strength and true alignment result — every time. All flights and fittings conform to new industrial standards making them interchangeable with other standard makes.

For reliable performance, specify Jeffrey — whether the smallest renewal part or a new standard spiral conveyor engineered for your special needs.

Write for Spiral Conveyor Catalog 851.

THE JEFFREY MANUFACTURING CO.

ESTABLISHED 1877

Columbus 16, Ohio

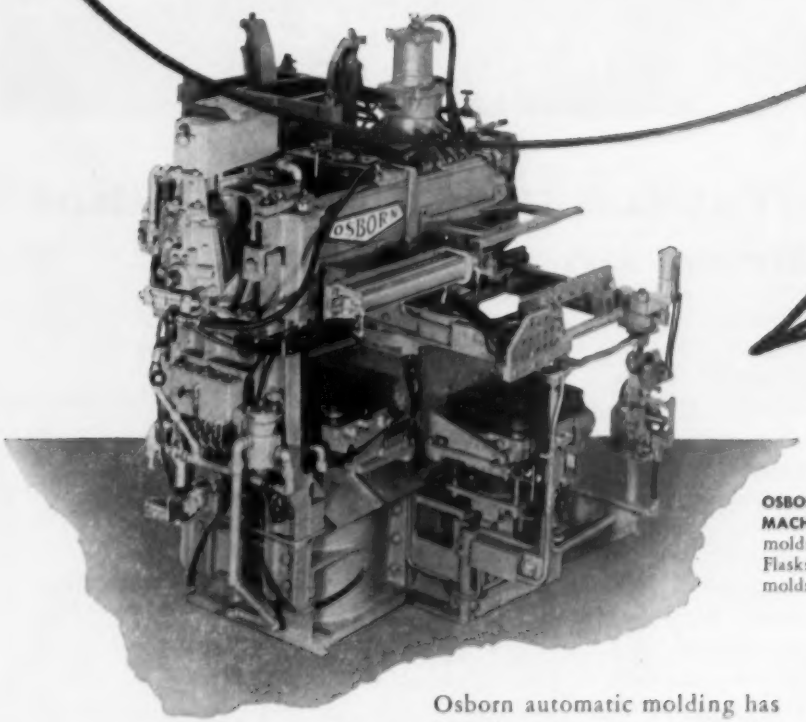
sales offices and distributors in principal cities

PLANTS IN CANADA, ENGLAND, SOUTH AFRICA.

IF IT'S MINED, PROCESSED OR MOVED

. . .IT'S A JOB FOR JEFFREY!

Whether you make castings or buy them— Osborn Foundry Automation can save you money



OSBORN MULTIPLE-STATION MOLDING MACHINE. Turns out up to 300 half molds per hour, hour after hour. Flasks are fed into one side, finished molds come out the other side.

OSBORN

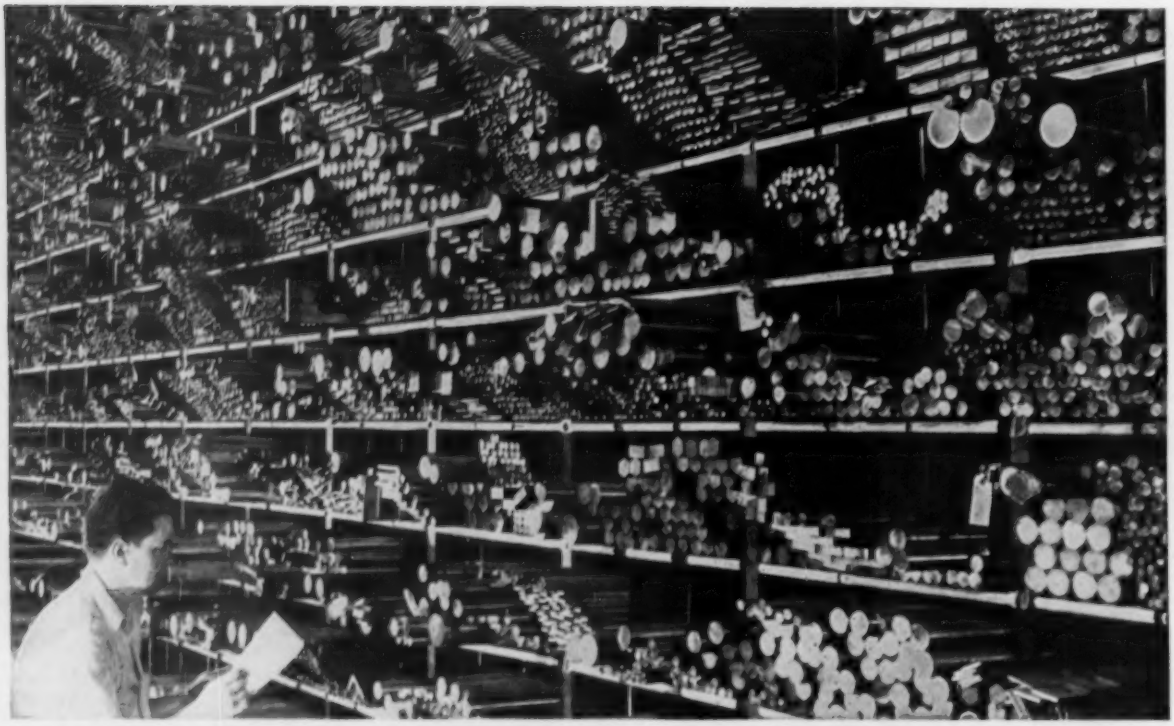
MOLDING MACHINES CORE BLOWERS
INDUSTRIAL BRUSHES

Osborn automatic molding has brought automation to the foundry . . . has increased production per man-hour as much as 500 percent.

With Osborn automatic machines, molds and cores for castings are made on pre-set time cycles. They are more uniform in density, more accurate in size . . . yet cost less to produce.

Whether you make or buy castings, it will pay you to have an Osborn specialist study your operations and show where foundry automation can cut your costs. Write *The Osborn Manufacturing Company, Dept. FF-32, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

ANOTHER EXAMPLE OF OSBORN LEADERSHIP AND ADVANCED ENGINEERING



Here's a STAINLESS "DEPOSIT" that You Can Draw on

Here's stainless steel bar stock ready for your instructions. It's just part of Armco's mill "bank" of finished products. When you can use stock that's on the racks, there's no waiting for the rolling of your order. It's ready now! Just tell us what you need and how you want it shipped.

SEMI-FINISHED STOCK TOO

In addition to finished bar and wire stock, Armco carries a large inventory of semi-finished stainless steel. These blooms, billets and rods are kept for quick conversion into standard and special sizes and shapes.

ALL STANDARD TYPES

Armco produces all standard analyses of stainless steel and special types in a wide range of sizes, forms and finishes. In free-machining types alone there are 11 different bar and wire grades. No other single plant can ship you stainless bars and wire in as wide a range of analyses, forms and conditions.

WHY HOLD UP PRODUCTION?

If you have reasonable quantities of stainless parts to make, we can probably supply you all the bars you need from stock. If your needs are large let us start you out with a stock shipment and follow with a rolling order—so there will be no time lost.

Give us a try! Just note quantities, types and sizes that you require on the attached coupon and mail it to us. We'll tell you promptly what we can do.

ARMCO STEEL CORPORATION
1005 Curtis Street, Middletown, Ohio

Give me price and shipping promise on these items of stainless steel:

Quantity	Type	Size and Finish

NAME:

FIRM:

STREET:

CITY: ZONE: STATE:

ARMCO STEEL CORPORATION 1005 CURTIS ST., MIDDLETOWN, OHIO

SPECIAL STEELS

SHEFFIELD STEEL DIVISION • ARMCO DRAINAGE & METAL PRODUCTS, INC. • ARMCO INTERNATIONAL CORPORATION

the IronAge

Editorial, Advertising and Circulation Offices, 100 E. 42nd St., N. Y. 17, N. Y. Oxford 7-3400

GEORGE T. HOOK, Publisher

TOM C. CAMPBELL, Editor

EDITORIAL STAFF

Managing Editor G. F. Sullivan
News-Markets Editor J. B. Delaney
Asst. News-Mkts. Ed. R. D. Raddant
Technical Editor E. C. Beaudet
Asst. Technical Editor W. G. Patton
Machinery Editor E. J. Egan, Jr.
Metal Finishing Editor J. J. Obrzut
Metallurgical Editor P. Unterweiser
Asst. News Editor E. C. Kellogg
Art Director J. A. Degen
Associate Editors: H. W. Van Camp; W. B. Olson. Assistant Editors: G. J. McManus; D. G. Picinich. Regional Editors: K. W. Bennett, Chicago; T. M. Rohan, Cleveland; T. L. Carry, Detroit; W. G. Brookfield, Pittsburgh; R. R. Kay, Los Angeles; G. H. Baker, R. M. Stroupe, N. R. Regelmbal, Washington. Editorial Assistants: M. A. Perrone, M. T. Powers, A. McCullough, C. E. Schroff, A. Schaeffer. Correspondents: F. L. Allen, Birmingham; N. Levenson, Boston; Richard Kopke, Buffalo; R. M. Edmonds, St. Louis; J. Miller, San Francisco; Erwin Laurence, Seattle; F. Sanderson, Toronto; F. H. Harley, London, England; Chilton Editorial Board; Paul Wooton, Washington representative.

WASHINGTON EDITORIAL OFFICE

Washington 4.....National Press Bldg.

BUSINESS STAFF

Production Manager B. H. Hayes
Director of Research Oliver Johnson
Circulation Mgr. W. M. Coffey
Promotion Manager J. A. Crites
Asst. Research Dir. Wm. Laimbeer

REGIONAL BUSINESS MANAGERS

Chicago 2....S. J. Smith, T. H. Barry
1 N. LaSalle St. Franklin 2-0203
Cleveland 14.....Robert W. Watts
1016 Nat'l City Bk. Bldg Main 1-2263
Columbus 15, Ohio....Harry G. Mumm
LeVeque-Lincoln Tower Capital 1-3764
Detroit 2.....Peirce Lewis
103 Pallister Ave. Trinity 1-3120
Los Angeles 28.....R. Raymond Kay
2420 Cheremoya Ave. Holy'd 7-0741
New York 17...C. H. Ober, C. T. Post
100 E. 42nd St. Oxford 7-3400
Philadelphia 39.....B. L. Herman
56th & Chestnut Sts. Granite 4-5600
Pittsburgh 22.....J. M. Spackman
1502 Park Bldg. Atlantic 1-1832
W. Hartford 7.....Paul Bachman
62 Lasalle Rd. Adams 2-0486
England.....Harry Becker
National Provincial Bank Chambers, 15 Grafton St., Altrincham, Cheshire.

One of the Publications Owned and Published by Chilton Co., Inc., Chestnut & 56th Sts., Philadelphia 39, Pa.

OFFICERS AND DIRECTORS

Joseph S. Hildreth, Ch. of the Board
G. C. Buzby, President
Vice-Presidents: P. M. Fahrendorf, Harry V. Duffy; Treasurer, William H. Valier; Secretary, John Blair Moffett; Directors: George T. Hook, Maurice E. Cox, Tom C. Campbell, Frank P. Tighe, L. V. Rowlands, Robert E. McKenna, Irving E. Hand, Everit B. Terhune, Jr., R. W. Case, Jr., J. C. Hildreth, Jr.

Indexed in the Industrial Arts Index and the Engineering Index.

BPA NBP

Editorial:

Does Your Customer Like You?

◆ BUSINESS IS GOOD. The way things are going you will continue to ring up the cash register—even though the wage and fringe bill will be higher for you before the year is out.

The recession is over and we are in a boom. The order books are getting fat with backlogs and the outlook for the future is better than at any time since early 1953.

The present Administration favors a square shake for business. Since the Secretary of the Treasury is a hardheaded businessman, no one can gripe that taxes are making him or his company poor—if the profits are rolling in. And they are rolling in for most of us.

So much for the top of the ground. What is going on beneath the surface? You may not know it but competition is digging either a grave for you or a foundation for a much bigger business. It depends on who you are. If you are working constantly at top speed to improve relations with your customers you are in clover. But if you are sitting back and letting the business roll in without checking your competition or making calls you are in for trouble.

Common sense (and practical research) shows that a good time to pat the customer on the back is when he is having trouble. Some customers—maybe many of yours—guessed wrong on supplies last fall. Now they are having a devil of a time getting what they want when they want it. And they aren't exactly in a pleasant frame of mind.

The easy thing to do is to stay away from them—without any personal visits from you or your salesmen. But that may be poison. It is now well known in some circles that those companies who ducked their customers when things were tight in the past lived to regret it.

Price isn't everything. Sure, it is a big part of selling. But so is personal attention. It is much better from your standpoint to level with your customers. Tell them face to face why things are tough for them. If you duck them now they have no one to chew at so they resent it—and you. And they don't forget either.

Give your customer the opportunity to see your salesmen. Give him a chance to sound off if he thinks he is being given a bad time. This way you will let him know you are sincerely interested in him. And also you can let him know what troubles you have, too. Chances are you will be up to or ahead of your competition.

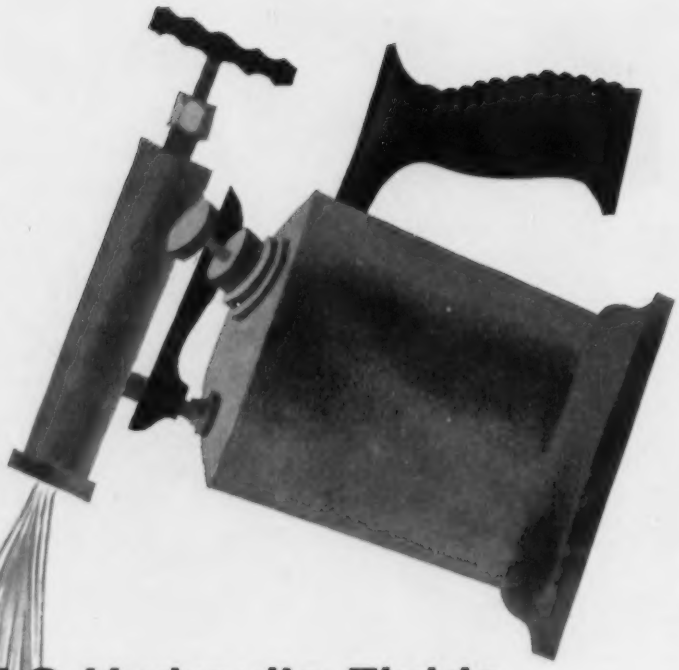
Tom Campbell

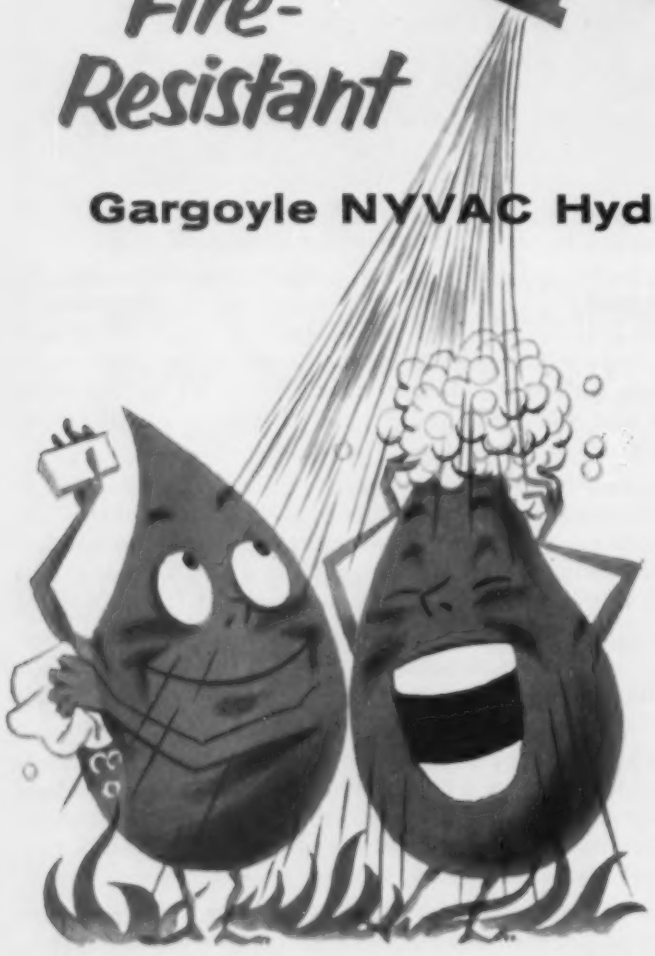
EDITOR

Now—here's
real fire prevention
for your plant . . .

New Fire-Resistant

Gargoyle NYVAC Hydraulic Fluids





Do you use hydraulic machines near furnaces, molten metal pots, red-hot steel slabs or other sources of ignition? If so, with oil in service, you have the possibility of a fire that could badly cripple your production.

New fire-resistant Gargoyle Nyvac hydraulic fluids will prevent such fires.

There are two types of these fluids—a straight synthetic fluid and a synthetic water base fluid. Both have been thoroughly proved in the field. Your particular machines and operations will dictate which product is best for your plant.

Although synthetic in composition, these new products are still designed to keep your machines running on full production schedules with low maintenance costs. They are backed by Socony Mobil's complete engineering service.

The new Nyvac fluids round out Socony Mobil's complete line of top-quality hydraulic fluids—all available from a single source of supply. Call your Socony Mobil man for complete details.

Socony Mobil *Correct Lubrication*

FIRST STEP IN CUTTING COSTS

SOCONY MOBIL OIL CO., INC., and Affiliates: MAGNOLIA PETROLEUM CO., GENERAL PETROLEUM CORP.

dear editor: *letters from readers*

Aluminum Powder

Sir:

Thank you very much for your kind letter of April 28 enclosing tear sheets of my article on sintered aluminum powder.

The Swiss emblem in front of my article really surprised me at first, but after finding out from your letter that it was art directed by a countryman of mine surprise turned into real pleasure and I compliment you on the results of your efforts. *R. Irmann, Societe Anonyme pour l'Industrie de l'Aluminium Neuhausen am Rheinfall, Switzerland.*

Deflated Dollar?

Sir:

On p. 63 of the May 5 issue, is a chart showing what is classed as a boom. The index base on which these data are plotted is 1947-49. Can you tell me how much the value of the dollar has declined since that date and where the data for March 1955 would fall if plotted in terms of 1947-49 dollars? *C. E. Patch, Morton C. Tuttle Co., Boston.*

This chart is based on Federal Reserve Board Index data. These indexes are not concerned with value of the dollar. They are based on such factors as physical volume of production and shipments, output per manhour, etc. In other words, the index figures are neither inflated nor deflated by dollar values.—Ed.

Chromium Steels

Sir:

Would you please forward to the undersigned tear sheets on Parts I and II of "How Chromium Steels Rate for High Temperature Aircraft Service" which appeared in the April 7 and 14 issues of THE IRON AGE. *I. C. Clingan, Director of Laboratories, Eastern Stainless Steel Corp., Baltimore, Md.*

Antifriction Bearings

Sir:

I am interested in learning more about the ceramic antifriction bearings mentioned in Newsfront, p. 45 of the April 21 issue. Any additional information that you may be able to supply will be greatly appreciated. *J. H. Fuchsluger, Metallurgist, Koppers Co., Inc., Baltimore.*

Additional information on the ceramic antifriction bearings may be obtained from Mr. Robert F. Rea, Manager, Research & Development Branch, Stupakoff Ceramic Mfg. Co., Latrobe, Pa.—Ed.

Stainless Designations

Sir:

We are interested in obtaining 12 tear sheets of the article "Revisions in AISI Stainless Designations Reflect Industry Practice," which appeared in the May 19 issue of THE IRON AGE starting on p. 122. *G. D. Klick, Advertising & Public Relations Manager, Lebanon Steel Foundry, Lebanon, Pa.*

West Coast Report

Sir:

We would like to obtain a tear sheet of the article "West Coast Report — Mathematicians Study Steel Planning" which appeared on p. 81 of the April 28 issue. *F. B. Newbert, Asst. General Purchasing Agent, American Brake Shoe Co., New York.*

Air Pollution

Sir:

I am interested in obtaining from you six tear sheets of the article entitled "Iron Foundries—Air Pollution: Furnace Types and Sizes Dictate Most Effective Controls" which appeared in your May 5 issue, pp. 110-112. *C. G. De Laval, Pittsburgh Alloy Co., Pittsburgh.*

MONEL • NICKEL • COPPER • ALLOYS

THIN STRIP

no standard is too exacting

Temper requirements for the thin nickel strip (.002") used in sensitive electronic tubes were too exacting to be checked by the usual methods. So Somers carefully hand checks several samples from each lot by the ultra-precise "bend test" illustrated above.

Since 1910 Somers Brass Company has specialized in producing thin strip: nickel and its alloys below .020" and copper and its alloys below .012" with the tensile properties, fatigue resistance, drawing properties and many other requirements which only the most exacting standards of production and quality control can meet.

Whatever your specifications may be, why not take advantage of Somers long experience? Write for field engineer or Confidential Data Blank for a complete survey of your problem at no cost or obligation.

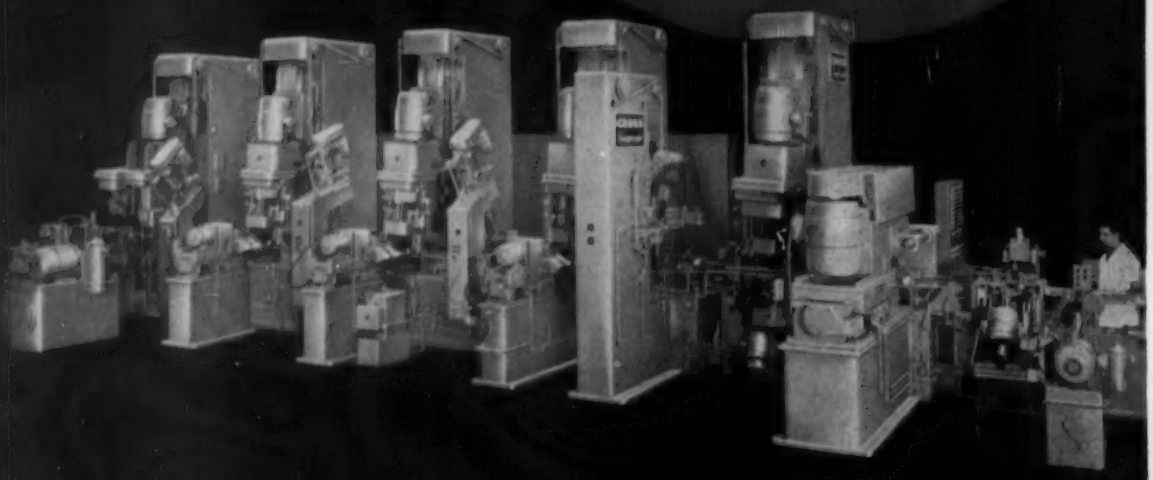
FOR EXACTING STANDARDS ONLY

Somers

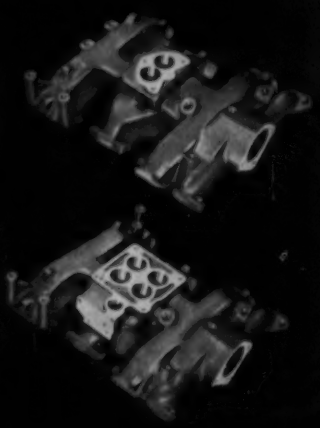
Somers Brass Company, Inc.
WATERBURY, CONN.

Another Transfer-matic by Cross

Mills, Drills, Bores, Taps, 2 and 4 Barrel Intake Manifolds



- ★ Rough and finish mills carburetor pad; mills choke pad (4 barrel only); bores carburetor port holes; drills and chamfers all holes (except 3 holes in water outlet pad); and taps all holes.
- ★ 140 pieces per hour at 100% efficiency.
- ★ Initial part location from port openings.
- ★ Push-button changeover from 2 to 4 barrel carburetor.
- ★ 13 stations; 1 loading, 11 working, 1 unloading.
- ★ Lift-and-carry type transfer mechanism.
- ★ Pre-set tooling throughout.
- ★ Other features: construction to J.I.C. standards; complete interchangeability of all standard and special parts for easy maintenance; hardened and ground ways; drag chain type chip conveyor.



Established 1898

THE CROSS CO.

DETROIT 7, MICHIGAN

Special MACHINE TOOLS

fatigue cracks

by William M. Coffey

The Winner

The grand contest is over. The Engineering Societies Library of New York is the richer by $500—and THE IRON AGE adds a distinctive trophy to the archives. This was the contest, you will remember, that helps celebrate our 100th Anniversary by awarding $500 to whomsoever could produce the oldest living issue of THE IRON AGE. The Engineers dug way deep and came up with the issue of January 2, 1873.

The smilling gentleman on the right is Mr. Ralph Phelps, director of the Engineering Societies Library; the smiling gentleman in the middle, who is passing the check with obvious pleasure, is Mr. George T. Hook, publisher of THE IRON AGE—and the smiling gentleman on the left is Mr. Tom Campbell, editor of THE IRON AGE. All in all a very happy little group. Mr. Phelps will use the money to supplement the library's collection in engineering and related fields. Mr. Hook is holding the winning issue . . .

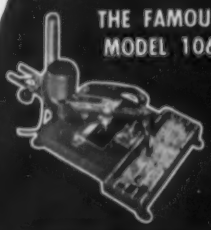
. . . and as you can see we looked like a newspaper in those days. The picture on the front page is a floating iron lighthouse that was erected near Liverpool, Eng.

Second prize of $100 was won by Schumacher-Kelly, Inc., of Freehold, (N. J.), with a June 17, 1875 issue of IRON AGE. The Schumacher-Kelly foundry is one of the oldest in the U. S., its history dating back nearly as far as IRON AGE itself. Follow this column for news of new contest coming in 2055.

unique in design —
rugged in construction

GREEN
PANTOGRAPH
ENGRAVERS

THE FAMOUS
MODEL 106



The three-dimensional bench Model 106 cuts costs — engraves, routs, models and profiles, giving you expert results even by unskilled workers.

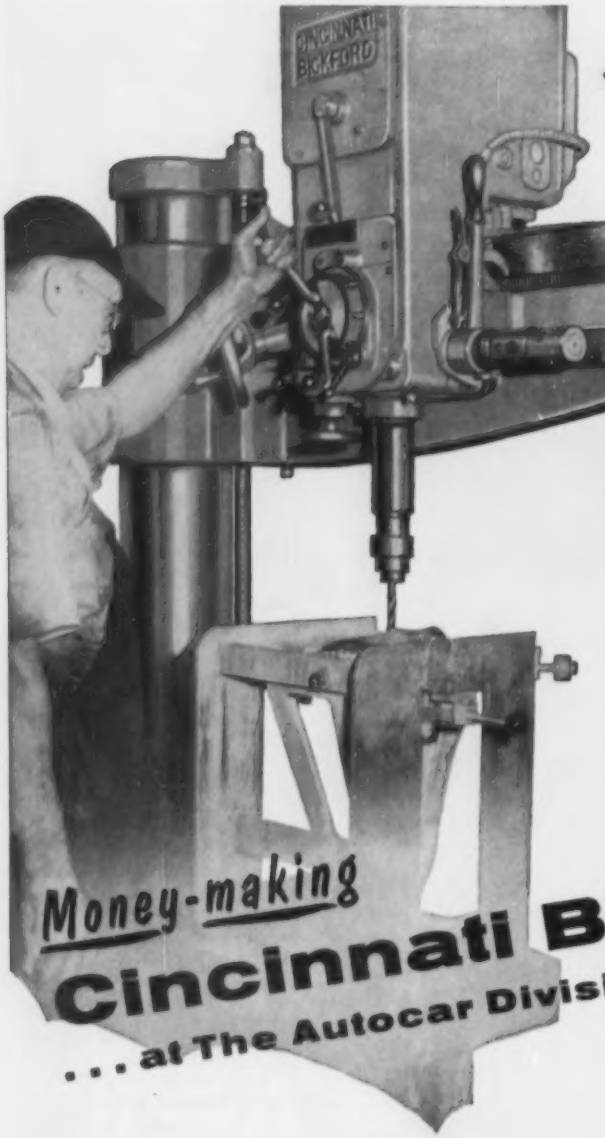
THE NEW
HEAVY-DUTY
MODEL D-2

The Model D-2 heavy-duty two dimensional Pantograph is a precision machine with a multitude of new features. Open on three sides, it permits complete freedom for engraving, milling, profiling large panels (up to 30" in diameter) or bulk pieces. Single, micrometer adjustment controls vertical depth of cut, automatically adjusting copy table with pantograph. Range of reduction ratios from 2-to-1 to infinity! Vertical range over 10 inches!

For complete information, write to

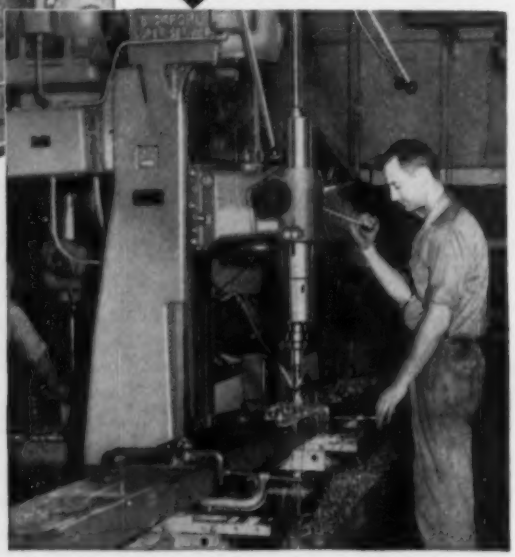
GREEN
INSTRUMENT COMPANY
365 Putnam Ave. Cambridge, Mass.

Export Agent—Fratham Co.
33 W. 42nd Street, New York 36, N. Y.



The 9" dia. column 3' arm Cincinnati Super Service Radial is working on chassis frame parts and aluminum steering column brackets; ¼" dia. to 1¼" holes drilled and reamed to a .0015" tolerance.

The Upright Drill shown is one of six 28" Super Service Uprights working on heat treated alloy steel frames.



Money-making Cincinnati Bickford machines ... at The Autocar Division, WHITE MOTOR CO. —EXTON, PA.

Photos courtesy the Autocar Division of The White Motor Company, Exton, Pennsylvania.

Speed and easy handling—power and accurate, steady performance were factors in the selection of Cincinnati Bickford Super Service Radial and Upright Drills in this plant. They are quickly adaptable to a variety of operations, including drilling, reaming, tapping and trepanning.

For rapid, accurate, dependable production investigate these cost reducing modern drilling machines.

Write for Bulletin R21C.

80 YEARS OF SERVICE

CINCINNATI BICKFORD

RADIAL AND UPRIGHT DRILLING MACHINES

THE CINCINNATI BICKFORD TOOL CO.

Cincinnati 9, Ohio, U.S.A.

dates to remember

JUNE

AMERICAN WELDING SOCIETY, INC. — Spring meeting, June 7-10, Hotel Muehlebach, Kansas City. Society headquarters are at 33 W. 39th St., New York.

GENERAL ELECTRIC COMPANY—3rd annual Welding Show, June 8-10, Municipal Auditorium, Kansas City.

SOCIETY O F AUTOMOTIVE ENGINEERS — Golden anniversary summer meeting, June 12-17, Chalfonte-Haddon Hall Hotel, Atlantic City, N. J. Society headquarters are at 29 W 39th St., New York.

EXPOSITIONS

AMERICAN ELECTROPLATERS' ASSN. —42nd annual exposition, June 20-23, Cleveland Public Auditorium, Cleveland.

MACHINE TOOL SHOW—Presented by National Machine Tool Builders' Assn., International Amphitheatre, Chicago. September 6-17, inclusive. This is the first industry-wide showing since 1947 of the advances in machine tools.

EDISON ELECTRIC INSTITUTE — Annual meeting, June 13-16, Los Angeles. Institute headquarters are at 420 Lexington Ave., New York.

RADIO - ELECTRONICS - TELEVISION MANUFACTURERS ASSN. — Annual convention, June 14-16, Palmer House, Chicago. Association headquarters are at 777 Fourteenth St., N. W., Washington, D. C.

INTERNATIONAL CONFERENCE ON COMBUSTION — June 15-17, Kresge Auditorium Building, Cambridge, Mass.

AMERICAN SOCIETY OF TRAINING DIRECTORS—11th annual conference, June 15-17, Los Angeles.

MALLEABLE FOUNDERS' SOCIETY—Annual meeting, June 16-18, The Greenbrier Hotel, White Sulphur Springs, W. Va. Society headquarters are at Union Commerce Bldg., Cleveland.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS—19th annual applied mechanics conference, June 16-18, on the campus of Rensselaer Polytechnic Institute, Troy, New York.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS—Diamond Jubilee semi-annual meeting, June 19-23, Statler Hotel, Boston. Society headquarters are at 29 W. 39th St., New York.

AMERICAN ELECTROPLATERS' SOCIETY—42nd annual convention, Cleveland Public Auditorium, Cleveland, June 20-23.

AMERICAN SOCIETY FOR ENGINEERING EDUCATION—June 20-24, 63rd annual meeting to be held at The Pennsylvania State University, University Park, Pa. Guest speaker is to be Secretary of Defense Charles E. Wilson.

ALLOY CASTING INSTITUTE—Annual meeting, June 26-28, Hot Springs, Va. Institute headquarters are at 32 Third Ave., Mineola, New York.

AMERICAN SOCIETY FOR TESTING MATERIALS — Annual meeting, June 26-July 1, Chalfonte-Haddon Hall Hotel, Atlantic City, N. J. Society headquarters are at 1916 Race St., Philadelphia.

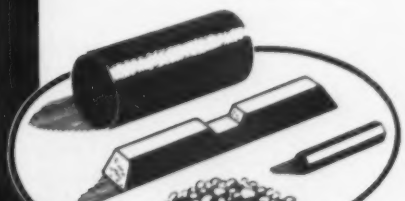
Here's help for exacting engineers and production men . . .

who must be absolutely right about metal analysis

WITH each MasterMet alloy you buy, Cannon-Muskegon gives you a certified, notarized analysis . . . black-on-white proof that MasterMet alloys are produced exactly to your specifications. This assures close predictable control of physical and chemical characteristics for any end-use. You can be confident that the results you plan — the performance you call for will be delivered in parts made with MasterMet alloys.

You can choose from a wide range of high alloys including cobalt-base and nickel-base alloys, chromium and chromium nickel stainless steels. Also included are such special alloys as Monel*, Inconel*, Invar, Ni-Resist*. Order these types or your custom specifications from Cannon-Muskegon.

*Trademark — International Nickel Co.



FOR REMELT OR PROCESSING

MasterMet alloys are available in shot, ingots and cast billets, bars and special shapes. Often the more common low alloy and 300 and 400 Series stainless steels can be shipped from stock. Remember . . . whatever your needs, Cannon-Muskegon can provide metallurgical engineering assistance in recommending the proper alloy — as well as the proper handling — to assure the best possible casting. Write for bulletin!

Cannon-Muskegon
CORPORATION
2889 LINCOLN STREET • MUSKEGON, MICHIGAN

ARE YOU ON OUR MAILING LIST

to receive inventory data on "in-stock" alloys? You'll find a surprising number of alloys listed ready for immediate delivery. Write today!

MASTERMET
CERTIFIED ALLOYS FOR INDUSTRY

This Steel keeps these outdoor phone

Republic Electro Paintlok

Year-round weather is mighty rough on outdoor phone booths. To make them practical from a maintenance standpoint, as well as continually attractive, a durable, long-lasting finish is a must.

That's why the Sherron Metallic Corporation of Brooklyn, New Yor[illegible], chose Republic Electro Paintlok for its popular all-metal outdoor booths.

Electro Paintlok is the zinc-plated steel sheet that is chemically treated to take paints, lacquers, synthetic enamels—and hold them in a tight grip for years, even under hard service and severe exposure.

Furthermore, only minimum maintenance is required. Should the painted surface become scratched, the tight zinc coating protects against underfilm corrosion and

REPUBLIC

World's Widest Range of Standard

REPUBLIC STEEL

REPUBLIC STEEL CORPORATION
3104 East 45th Street • Cleveland 27, Ohio

Please send more information on:

- ☐ Republic Electro Paintlok
- ☐ Republic Stainless Steel
- ☐ Republic Mechanical Tubing
- ☐ Republic Cold Finished Steel Bars and Shafting

Name _____ Title _____

Company _____

Address _____

City _____ Zone _____ State _____

K-3005

booths color-bright

provides lasting paint adherence

creeping rust that would eventually cause trouble.

Republic Electro Paintlok is easy to fabricate, too. The well-bonded zinc coating will not fracture during fabricating, will not crack, peel or flake when punched or sheared.

The entire finishing operation is speeded because Electro Paintlok requires no special cleaning. A water-soluble cleaner will quickly remove fingermarks and warehouse dirt. And since surfaces are pre-conditioned, no pre-etching is required.

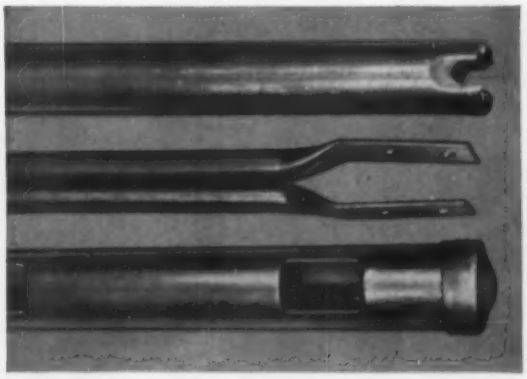
If you want your painted or enameled steel products to look better longer, get the complete facts on Republic Electro Paintlok. Send coupon for Republic Book 525.

STEEL

Steels and Steel Products

ENDURO STAINLESS STEEL DOES MANY JOBS EFFICIENTLY AND ECONOMICALLY. Here ENDURO, produced at Republic's Alloy Division, is used in a bellows that goes between a jet engine and exhaust tubes because of its heat-resistance and ability to expand and contract uniformly. There are other advantages—such as increased structural strength without added weight. Corrosion-resistance. High physical and chemical properties. Republic metallurgists will help you use ENDURO to best advantage.

COLD FINISHED STEEL BARS AND SHAFTING by Republic have a bright, smooth surface that rarely requires further machining. In addition, they include all the other qualities you want in steel parts production—accuracy of section, high strength, close tolerance, and uniformly high *machinability* to help you produce more parts at lower unit cost. Republic's Union Drawn Division supplies cold finished rounds, squares, hexes and flats in all standard and special carbon, alloy and stainless steel analyses.



IF YOUR PRODUCT INCLUDES TUBULAR PARTS, you can save an investment in new equipment by letting Republic produce them. Its Steel and Tubes Division has complete facilities for handling all kinds of tough fabricating jobs—like bending, broaching, coiling, configuring, expanding, flattening, grooving, notching, upsetting, tapering—to name just a few. For precision on a production basis—that will lower your fabricating costs—call Republic. Send coupon.

PORTAGE

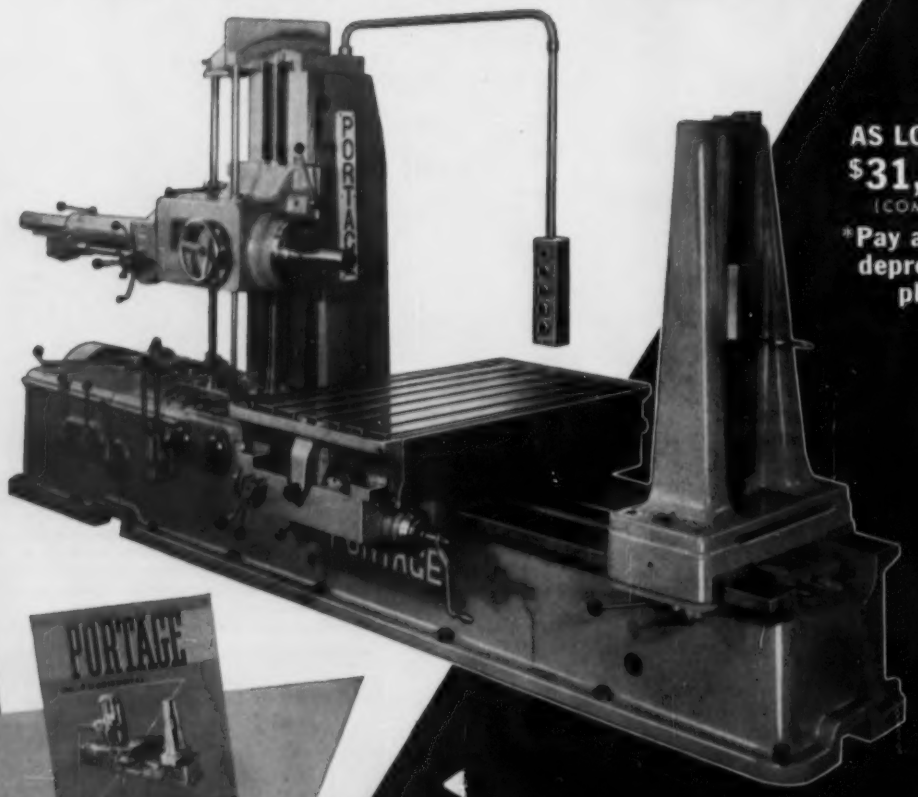
(4" Diameter Spindle)

Horizontal Boring, Drilling & Milling Machine

Outstanding . . .

MACHINE OF THE YEAR

Unsurpassed in Price and Quality



AS LOW AS
$31,358
(COMPLETE)
***Pay as you depreciate plan**

Write for Catalog today!

The PORTAGE Boring, Drilling & Milling Machine offers a *real* saving in new machine investment. PORTAGE mills cost from 5% to 20% *LESS* than present comparable makes . . . and the amazing part of this savings is the machine itself . . . Write today for literature covering all the specifications and features on the PORTAGE Mill.

* For full particulars, phone the factory today!

THE PORTAGE MACHINE CO.

1035 Sweitzer Avenue • Akron 11, Ohio

Representatives in Principal Cities

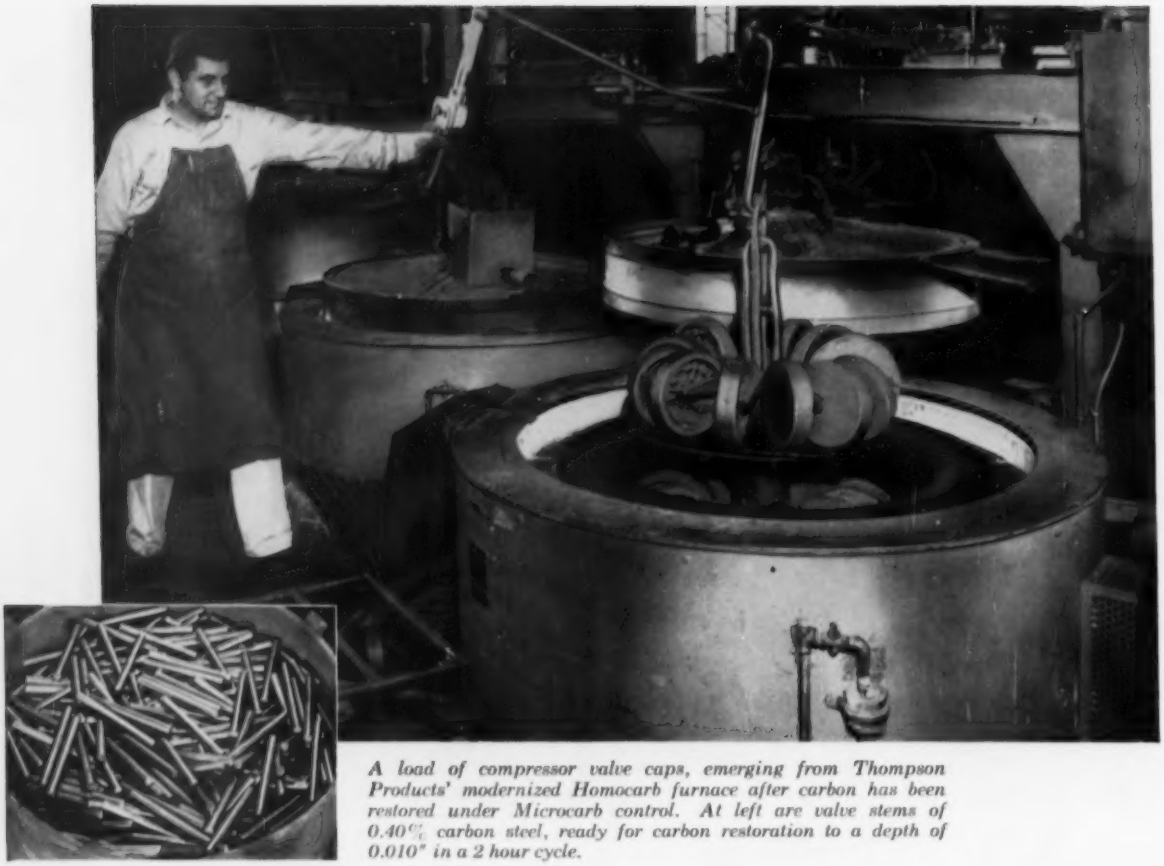
BUILDERS OF PRECISION MACHINE TOOLS, SPECIAL AND PRODUCTION MACHINERY SINCE 1916

STAINLESS STEEL FOR TRANSPORTATION

McLouth STAINLESS Steel

High quality stainless sheet and strip steel . . . for the product you make today and the product you plan for tomorrow.

McLouth Steel Corporation
DETROIT, MICHIGAN
Manufacturers of Stainless and Carbon Steels



A load of compressor valve caps, emerging from Thompson Products' modernized Homocarb furnace after carbon has been restored under Microcarb control. At left are valve stems of 0.40% carbon steel, ready for carbon restoration to a depth of 0.010" in a 2 hour cycle.

Decarb Correction with Microcarb® Saves 4 Ways

FOR THOMPSON PRODUCTS

A real decarb problem has been ended at the Bell, California plant of Thompson Products, Inc. In the production of valves and aircraft parts, decarb kept cropping up at various stages in fabrication. The problem was to correct it without interrupting production by making a special case of each occurrence.

The solution to the problem appeared with Microcarb atmosphere control, which automatically measures and regulates the active carbon inside a Homocarb furnace. Thompson applied Microcarb equipment to one of their 25" x 36" Homocarb furnaces. It didn't take long to prove that Microcarb was the tool needed to lick the decarb problem.

Now this furnace handles any decarb condition on a production basis. It restores either mill decarb or surface carbon lost in hot-working, and replaces surface carbon on any part which has been decarburized below finished specs.

Fourfold savings have resulted:

1. No more decarburized products; no rejects due to decarb.
2. No more excessive machining to correct for non-uniform carburizing.
3. Reduction in inspection time.
4. Decarburized mill stock can be restored.

The combination of Homocarb furnaces . . . either pit or horizontal type . . . with Microcarb atmosphere control makes the measurement and control of active carbon inside the furnace just as continuous and automatic as temperature control. Whether specifications demand case carburizing, hardening, homogeneous carburizing or carbon restoration . . . *the carbon you set is the carbon you get!*

If you're now using Homocarb furnaces, Microcarb control can be added by your regular maintenance crews. To explore potential savings and conversion costs, there's an L&N field engineer ready to help you. Just phone the nearest L&N Office or write us direct at 4956 Stenton Ave., Phila. 44, Pa. For details about the workings of Microcarb control, request Catalog TD4-620(2).

LEEDS NORTHRUP

instruments automatic controls • furnaces

YOU GET MORE OF THE FEATURES YOU NEED MOST in a Bucyrus-Erie Transit Crane

HERE'S PROOF....

Your Bucyrus-Erie distributor can give you plenty more!

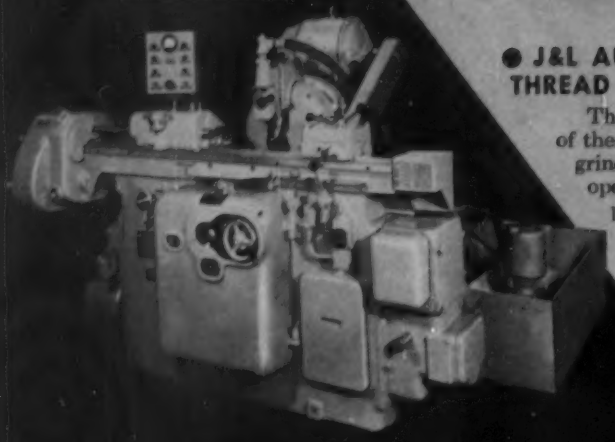
FEATURE	MODEL 15-B	MODEL 22-B	HOW YOU BENEFIT
Friction swing brake.	Standard	Standard	Operator can spot and hold boom point over desired position.
Power controlled lowering for main hoist line on lifting crane.	Standard	Standard	Provides high accuracy in lifting or lowering loads.
Independent power boom hoist with power controlled lowering.	Standard	Standard	Boom angle can be changed while machine is swinging or propelling, while load is being hoisted or lowered.
Open-throat boom design.	Standard	Standard	Permits rigging 2, 3, or 4 parts of line without removing sheave guards.
8-part pendant suspension.	Standard	Standard	Ideal for changing boom lengths conveniently and with minimum downtime.
Safety boom stops on all machines equipped for lifting crane service.	Standard	Standard	Added safety. Prevents boom from accidentally snapping over center and striking cab.
Boom angle indicator.	Standard	Standard	Enables operator to determine angle of boom at all times.
Full 3-side vision from operator's cab.	Standard	Standard	Gives him clear view of his entire operating range and of all men or obstructions in the vicinity.
16-part boom suspension.	Optional at extra cost	Optional at extra cost	Provides slower boom hoisting or lowering for even greater precision control.
Boom folding mechanism.	Optional at extra cost	Optional at extra cost	Booms over 60 feet long can be carried folded on job-to-job moves.

BUCYRUS ERIE

BUCYRUS-ERIE COMPANY
SOUTH MILWAUKEE, WISCONSIN

126E55C

Looking for higher production

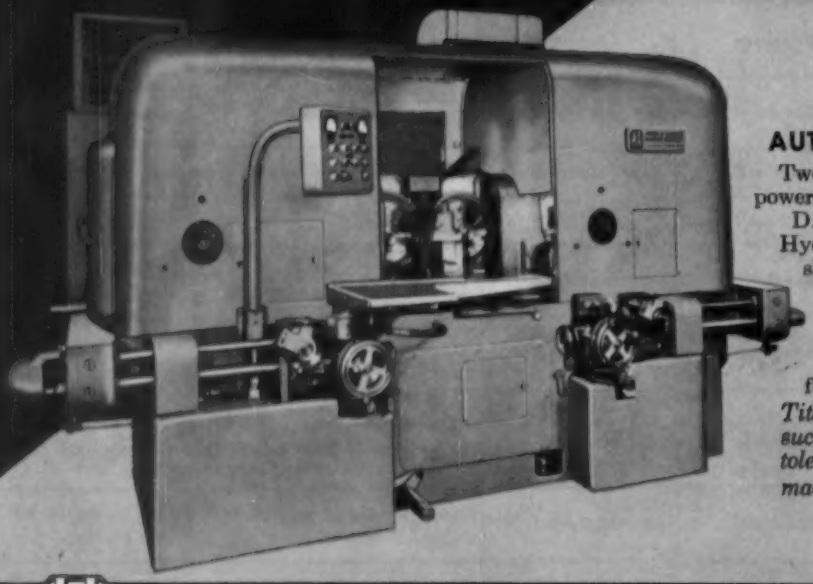


● J&L AUTOMATIC THREAD GRINDER

The self-trueing, self-sizing mechanism of these machines has made thread grinding a practical, profitable production operation. They can be arranged for plunge grinding single or multiple grooves or contours, and for grinding threads with multi-rib wheels, either diamond or crush dressed.

MODEL E AUTOMATIC FORM GRINDER ●

Completely automatic cycle. High speed approach, wheel feed spark-out and withdrawal are positively controlled through simple cam action, ensuring constant, uniform operation under all conditions.



● MODEL D DUO WHEEL AUTOMATIC FORM GRINDER

Two 20″ dia. grinding wheels, powered by 20 HP A.C. motors, or D.C. with rheostat control. Hydraulically operated vertical slide, mounts work holding fixtures. The stroke may be adjusted to accommodate a variety of work. These models are equipped with full vapor control.

Titanium alloys have been successfully ground to tolerances with this machine.

JONES & LAMSON MACHINE COMPANY

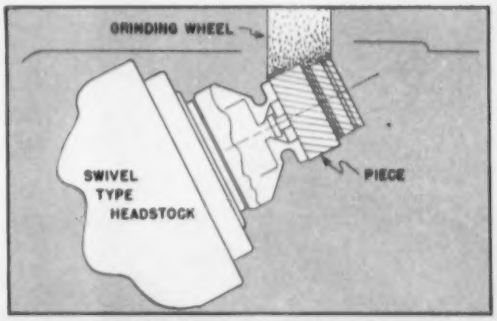
Jones & Lamson offers you a choice of methods for acquiring modern, profit-producing J&L equipment. In addition to outright purchase, J&L makes available several different "Pay-from-Productivity" plans at interest rates of 3¼ % and lower (add-on), and a broad variety of leasing plans.

Send today for complete information. Simply fill in the coupon, *clip it to your letterhead and mail.*

and greater accuracy?

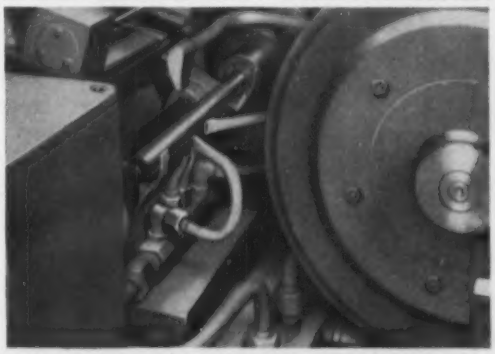
...why not GRIND IT?

Newly developed materials, plus the constant demand for higher production and greater accuracy, are causing industry to step up its search for better methods of producing a great variety of work. In many instances it is found that Automatic Thread and Form Grinders can perform a great many different and difficult production jobs with greater speed and precision than was ever possible with the use of conventional equipment.



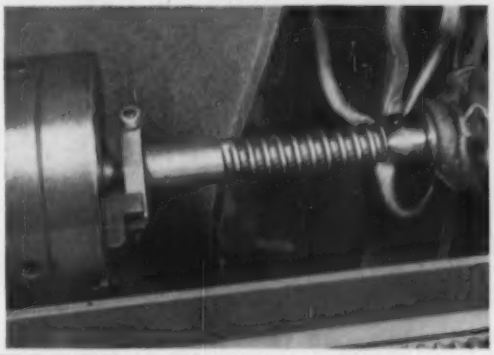
ANGLE GRINDING

This piece is held on an angle by an expanding air-operated arbor in the swivel type headstock of the J&L Model E. Four diam. are ground in one pass with a single wheel.



AUTOMATIC HANDLING

J&L Grinders are readily equipped with automatic handling for maximum output along production lines. This machine has a magazine feed for automatic loading and unloading of parts to be plunge ground for the automotive industry.



STOCK REMOVAL

J&L Wheel Spindles — grease packed for life, allow heavy stock removal such as on this worm (dia. 1.141″, stock removed — .1235″). Plunge ground from the solid — one cut. Increased production 160% over previous method.

P.S. On the basis of increased quality and more production per labor hour, we invite the opportunity to improve upon your existing methods.

MACHINE TOOL DIVISION

UNIVERSAL TURRET LATHES • FAY AUTOMATIC LATHES • AUTOMATIC DOUBLE-END MILLING & CENTERING MACHINES • AUTOMATIC THREAD & FORM GRINDERS • OPTICAL COMPARATORS AUTOMATIC OPENING THREADING DIES & CHASERS

511 Clinton St., Dept. 710, Springfield, Vt., U.S.A.

JONES & LAMSON MACHINE COMPANY
511 Clinton St., Dept. 710, Springfield, Vt., U. S. A.

Please send me the J&L Machine Tool Replacement Information Kit.

Name.....

Title.....

MOTOR CONTROL FACTS
ON INDUSTRY'S
MOST COMPLETE LINE

FACT: Here is industry's newest and most advanced high-voltage starter!

This new line of Westinghouse high-voltage fused starters offers industry more protection—more operating simplicity than any other. Here are a few reasons why:

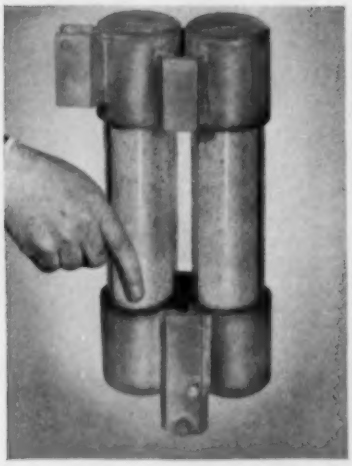
Extension of the BAL fuse line up to 400 amperes with the first and only 400-ampere, double-barreled, single-unit fuse; a new 50,000-kva air break contactor featuring the most advanced arc interrupting action yet developed; and new enclosures providing new levels of convenience and safety.

Booklet B-6535 has more facts on this outstanding new starter. Get it from your Westinghouse engineer—or write Westinghouse Electric Corporation, 3 Gateway Center, P. O. Box 868, Pittsburgh 30, Pa.

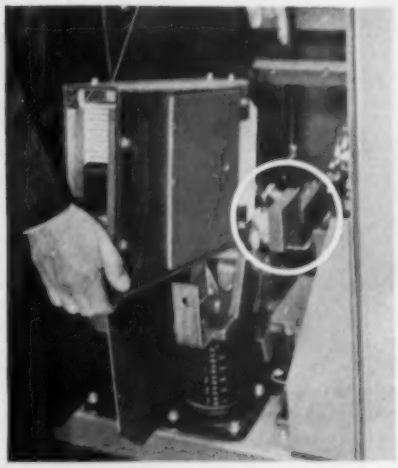
J-21898

YOU CAN BE SURE... IF IT'S

Westinghouse



New 400-ampere, double-barreled, type BAL fuse features "no-bolt" brazed connections which insure equal division of current. Complete coordination of fuses is assured. Exclusive BAL single-barreled design for fuses up to 200 amperes is retained.



New air break contactor (200 and 400-ampere sizes) features a unique arc chute design which greatly simplifies inspection and maintenance of the contacts. Simply pull the arc chute down—contacts are immediately and conveniently accessible.

New enclosure design provides both mechanical and electrical interlocks; front and rear access DOORS; top-mounted bus arrangements; separate compartmentation of high and low-voltage components—all designed for maximum safety of personnel.

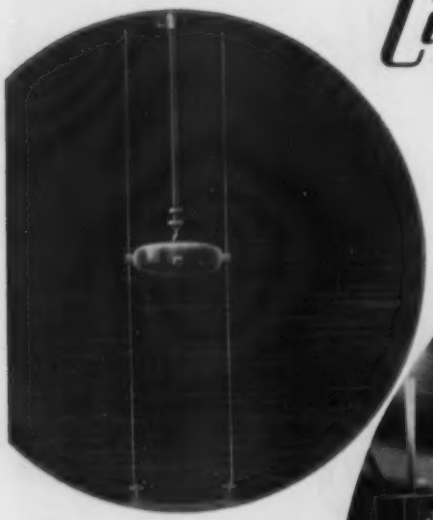
FROM INDUSTRY'S MOST COMPLETE LINE OF INDUSTRIAL CONTROL

CONTROL COMPONENTS • MOTOR CONTROL • ELECTRONIC CONTROL • CONTROL SYSTEMS • NATIONAL SERVICES

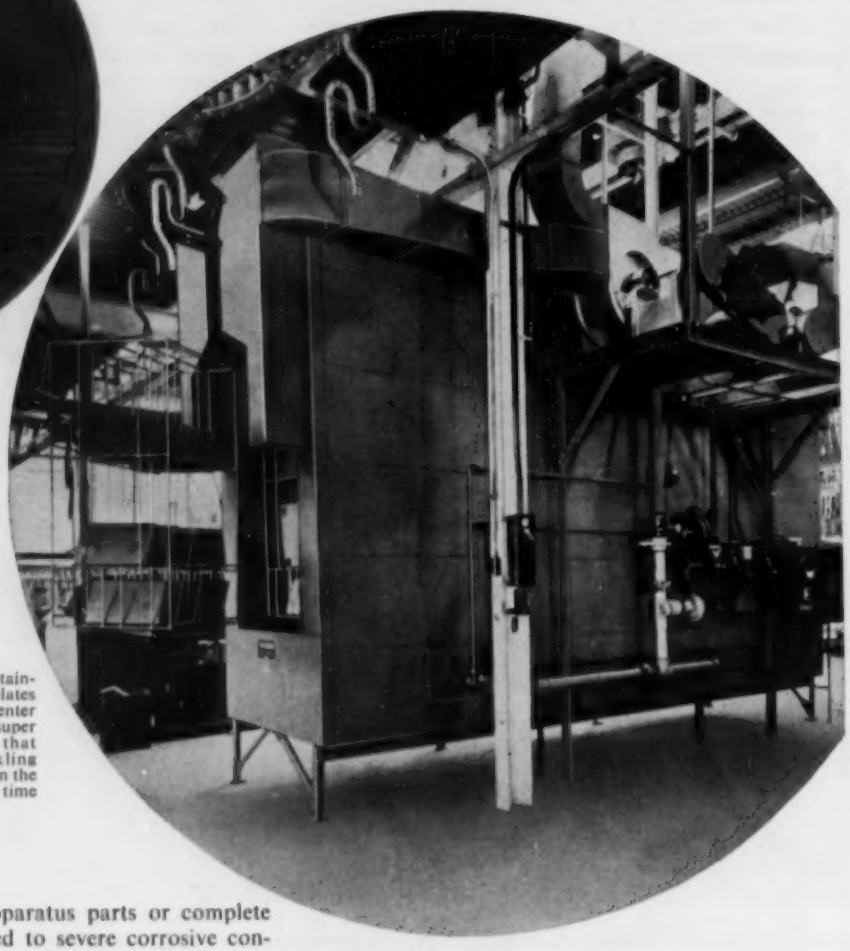
In Small Parts or Large...

Carpenter Stainless No. 20

Controls STRONG Corrodents



SMALL—This diagram shows float and attached steel indicator strip of an automatic gauge used in sulphuric acid storage tanks. These parts are made from Carpenter Stainless No. 20 and No. 20Cb for longer life.



LARGE—Carpenter Stainless No. 20Cb sheet, plates and tubing, and Carpenter No. 20 bars provide super corrosion resistance that keeps huge acid-pickling machines like this one on the job, saves maintenance time and expense.

Wherever you have small apparatus parts or complete large-scale equipment subjected to severe corrosive conditions, you can build extra service life into them with Carpenter Stainless No. 20 and No. 20Cb.

This super stainless alloy is highly resistant to H_2SO_4 concentrations or solutions, as well as a long list of other strong corrodents. So build with Carpenter Stainless No. 20 and No. 20Cb for greater freedom from corrosion troubles, extended equipment life, less down-time for replacements, and greatly reduced corrosion control costs.

This time-saving, cost-cutting super corrosion-resistant Carpenter stainless alloy is available in the form of No. 20Cb tubing, pipe, sheet and plate, as well as No. 20 bar, wire, strip, and billets. Ask your nearest Carpenter distributor or sales office for assistance on your corrosion problems . . . and a copy of the NEW Carpenter Stainless No. 20 and No. 20Cb handbook.

MEMBER

The Carpenter Steel Company,
Alloy Tube Division, Union, N. J.

Export Dept., The Carpenter Steel Co., Port Washington, N. Y.—"CARSTEELCO"

Carpenter

Stainless Tubing & Pipe

Steel-Weld
FABRICATION
Use WELDED STEEL
for Greater Strength
with Less Weight!
Precision machining operations on heavy cumbersome pieces, such as the base and cover of a 200,000 kw Steam Turbine illustrated above, are not uncommon in the Steel-Weld Division of the Mahon Company. Mahon service to manufacturers of processing machinery, machine tools, and other types of heavy mechanical equipment is complete in every respect: Design-engineering, Fabrication, Magnetic and Radiographic Inspection, Stress Relieving, Grit Blasting, Machining and Assembling. If you use weldments in your product, or if parts of your product could be produced to better advantage in welded steel, you will find in the Mahon organization a unique source . . . a source where design skill and advanced fabricating technique are supplemented by craftsmanship which assures a smoother finer appearing job embodying every advantage of Steel-Weld Fabrication. See Sweet's Product Design File for information, or write for Booklet showing Mahon facilities and capabilities in this field.
THE R. C. MAHON COMPANY
DETROIT 34, MICHIGAN
Engineers and Fabricators of Steel in Any Form for Any Purpose
MAHON

T-V makers keep a Clear Picture of Assembly Costs... with AMERICAN PHILLIPS Screws

Top output . . . no costly cabinetwork or parts slashed or smashed by slipping screwdrivers . . . no workers out with gashed hands ...those are some of the advantages of American Phillips Fastening which combine to give TV and radio makers a strong signal that assembly costs can be cut as much as 50%.

And just as Phillips Screws are tops in modern fasteners, so American has been a top producer ever since it introduced the Phillips Recessed Head to industry. That's why so many manufacturers of leading products in every line rely on American as their No. 1 Phillips supplier...for they know that American's capacity and standards of quality will keep their assembly lines moving at top speed, day in, day out. *Your* experience will be exactly the same . . . *try it and see.*

✕ *marks the spot. . . the mark of extra quality*

AMERICAN SCREW CO.

PHILLIPS HEADquarters
WILLIMANTIC, CONNECTICUT

Plants at Willimantic, Conn. and at Norristown, Pa.
Warehouse and office at Chicago
Office, Detroit, Michigan

SEE RUST-OLEUM APPLIED DIRECTLY OVER SOUND RUSTED SURFACES! MAKE THIS TEST UNDER YOUR OWN CONDITIONS AND SEE PROOF OF PERFORMANCE!

See Rust-Oleum 769 Damp-Proof Red Primer actually applied over a badly rusted surface after simple scraping and wire-brushing to remove rust scale and loose rust in the Rust-Oleum *"rusted panel demonstration."* Rust-Oleum's specially-processed fish oil vehicle *penetrates* rust to bare metal usually eliminating sandblasting and other costly surface preparations.

Rust-Oleum finish coatings in Aluminum, Green, White, Gray, Yellow, Black, Orange, Blue and others provide both *Rust Prevention* and *Decorative Beauty!* Specify Rust-Oleum for new construction, maintenance, and re-modeling. See Sweets for complete catalog and nearest Rust-Oleum Industrial Distributor, or attach coupon to your business letterhead.

RUST-OLEUM®

STOPS RUST!

There Is Only One Rust-Oleum. It Is Distinctive as Your Own Fingerprint. Resists Rain, Sun, Fumes, Snow, Heat, Salt Air, Salt Water, etc.

See local classified telephone directory under Rust Preventives or Paints for nearest Rust-Oleum Industrial Distributor.

ATTACH TO YOUR BUSINESS LETTERHEAD AND MAIL TO:

Rust-Oleum Corporation, 2561 Oakton St., Evanston, Ill.

- ☐ Please Show Me the Rust-Oleum "Rusted Panel Demonstration."
- ☐ Test Application of Rust-Oleum Over Rusted Metal Surfaces in My Plant.
- ☐ Complete Literature with Color Chart.
- ☐ Nearest Rust-Oleum Industrial Distributor.

Photo courtesy The Alliance Drop Forging Co.

●Youngstown Hot Rolled Alloy Bars assure uniform response in our customers' operations because such uniformity starts at the Ore Mines. At every operation, in Youngstown's completely integrated steel manufacturing facilities, rigid quality controls make certain that uniform chemistry, physical properties and dimensions are furnished.

SPECIFY

Youngstown

Hot Rolled QUALITY YOUNGSTOWN SERVICE Alloy Bars

THE YOUNGSTOWN SHEET AND TUBE COMPANY Manufacturers of Carbon, Alloy and Yoloy Steel

General Offices: Youngstown, Ohio - District Sales Offices in Principal Cities

SHEETS - STRIP - PLATES - STANDARD PIPE - LINE PIPE - OIL COUNTRY TUBULAR GOODS - CONDUIT AND EMT - MECHANICAL TUBING - COLD FINISHED BARS - HOT ROLLED BARS - BAR SHAPES - WIRE - HOT ROLLED RODS - COKE TIN PLATE - ELECTROLYTIC TIN PLATE - RAILROAD TRACK SPIKES

Slits, coils 1/8" steel at high speeds

... with cutters on TIMKEN® bearings

STEEL of ¼-inch thickness is slit and coiled at high speeds by this Stamco 60" Coil Slitter. To carry the heavy loads and to keep the cutters aligned, Stamco mounts the cutter arbors on Timken® tapered roller bearings. And to assure a smooth, even transmission of power, all gear reduction units are mounted on Timken bearings.

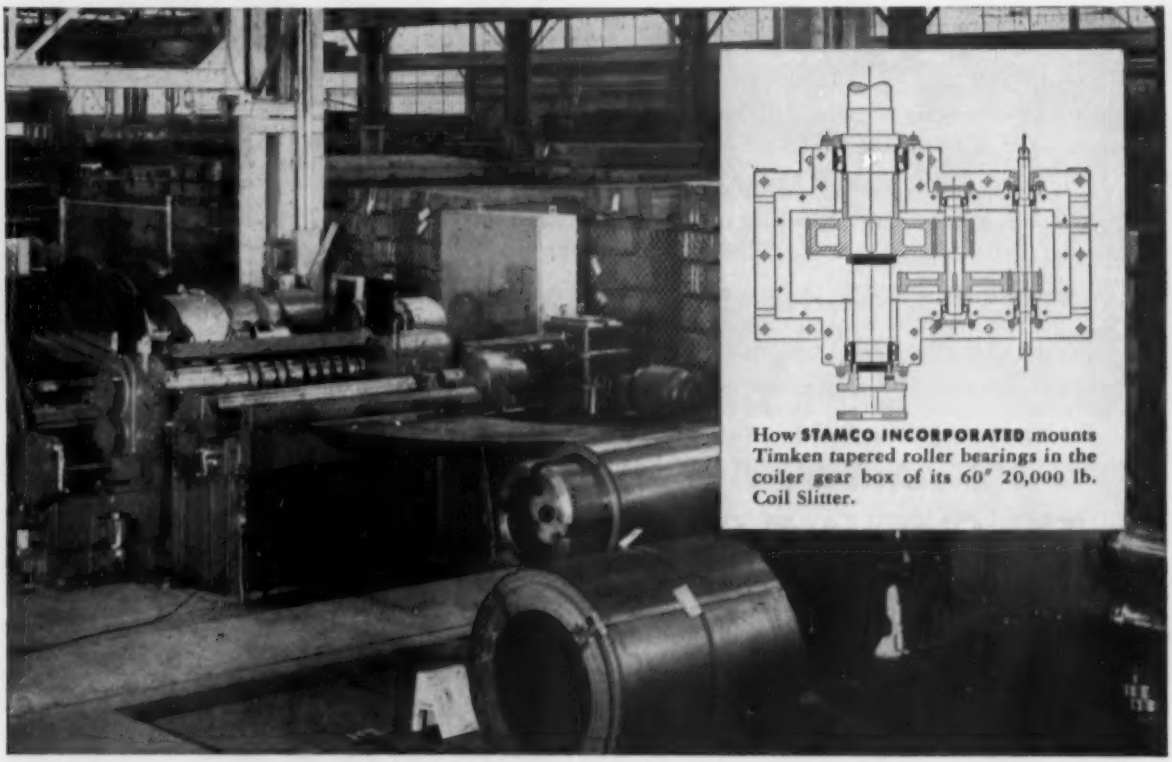
Line contact between the rollers and races of Timken bearings gives them extra-carrying capacity. And their tapered design enables them to take both radial and thrust loads in any combination. Cutter arbors are kept in positive alignment, insuring precise slitting even at high speeds (on light-gauge steel up to 2,200 feet per minute).

Because reducer shafts are also held in rigid alignment, gears mesh accurately to give a smooth flow of power, less gear wear, less maintenance. Power loss is further reduced because the true rolling motion and smooth surface finish of Timken bearings make friction negligible.

These bearings are made of the finest steel ever developed for bearings—Timken fine alloy steel. We have to make it ourselves because that is the only way we can get steel good enough for Timken bearings. They normally last the life of the coil slitter.

No other bearing gives you all the advantages you get with Timken bearings. Specify them for all the machines you build or buy. Look for the "Timken" trade-mark on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



How **STAMCO INCORPORATED** mounts Timken tapered roller bearings in the coiler gear box of its 60" 20,000 lb. Coil Slitter.

IT'S TIMKEN BEARINGS FOR VALUE!

To get the best value in bearings you may find this simple formula helpful:

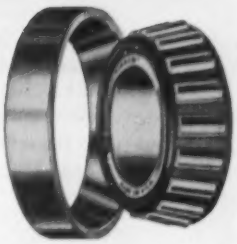
$$Value = \frac{quality + service + public\ acceptance}{price}$$

Obviously a big advantage *above* the line gives you more value than a small one *below*. No other bearing can match the uniform high quality, engineering and field service and overwhelming public acceptance you get with Timken bearings.

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS



NOT JUST A BALL ○ NOT JUST A ROLLER ⊂⊃ THE TIMKEN TAPERED ROLLER ⊂⊃ BEARING TAKES RADIAL ⟨⟩ AND THRUST →⟨⟩← LOADS OR ANY COMBINATION

Which is the CleCap?

...the unusually LARGE one that's hard to find

One of the advantages CleCap customers enjoy is the knowledge that when they want some of those BIG cap screws, the chances are 9 out of 10 we can ship them the same day.

CleCap makes 'em regularly from ¼" to 2½" diameters, any length you want—ferrous and non-ferrous—and we stock a lot of unusual sizes, nearly 10,000 different items last count.

That's another reason for dealing with *The* cap screw specialists of the country. You also get unbeatable top-quality fasteners . . . PLUS a CleCap crew that has a long-made rep for "busting a leg" to get you what you want exactly when you want it.

What happens to your profits when late deliveries hold up production lines? Put your cap screw needs up to CleCap . . . and relax!

The Cleveland Cap Screw Co.
2929 EAST 79TH STREET • CLEVELAND 4, OHIO
VU Iean 3-3700 TWX CV42

WAREHOUSES:
Chicago • Philadelphia • New York
Providence • Los Angeles

CLEVELAND *Top Quality* FASTENERS

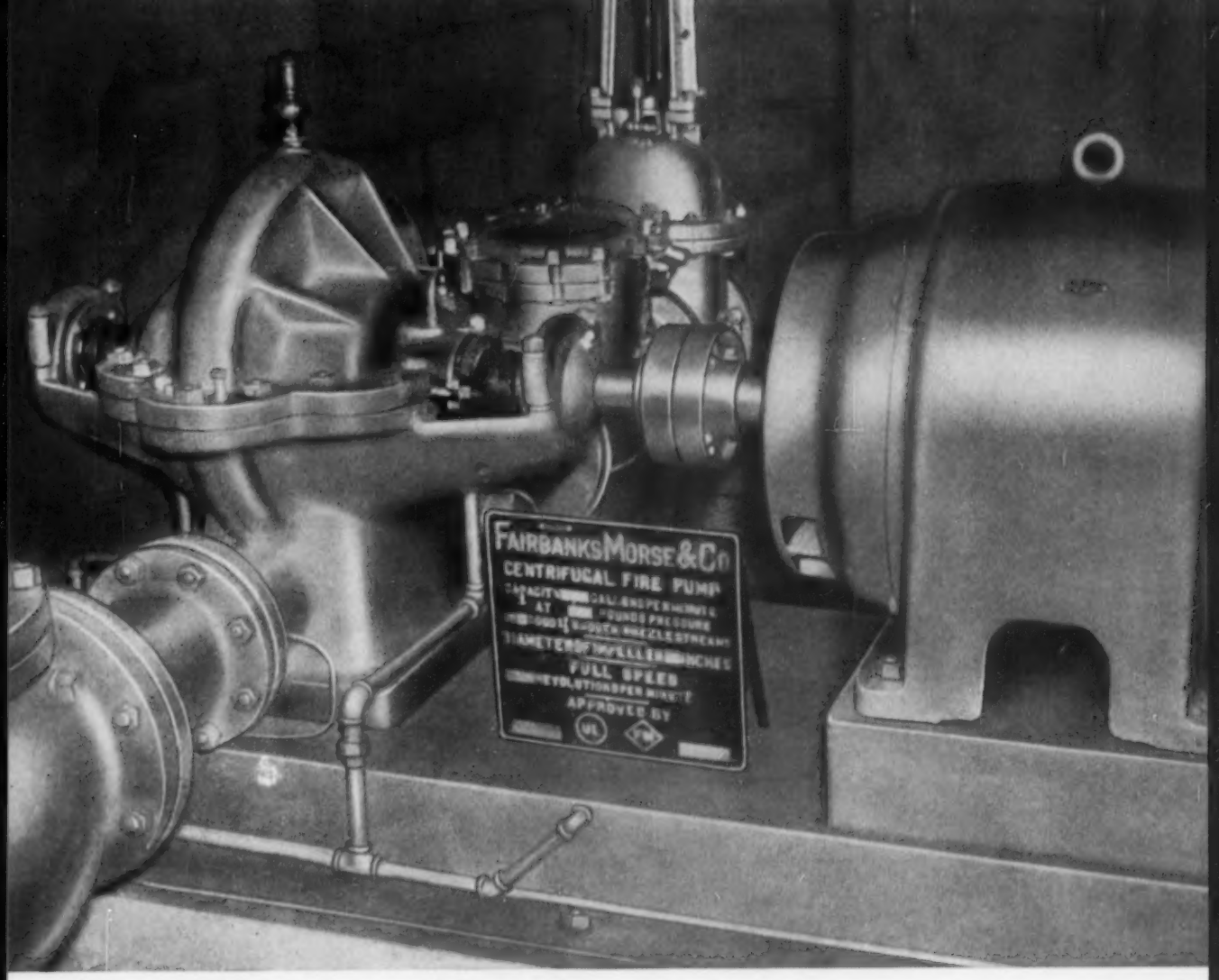
Ferrous and Non-Ferrous: Bright, High Carbon and Alloy Steel Heat Treated, Brass, Silicon Bronze, Stainless Steel

Hex Head Cap Screws: ¼" to 2½" dia.
Socket Head Cap and Set Screws—Plain and Knurled: ¼" to 1½" dia. Also Flat and Button Head Styles.
Flat Head Cap Screws: ¼" to 1" dia.
Fillister Head: ¼" to 1" dia.
Set Screws—Square Head: ¼" to 1½" dia.
Milled Studs: ¼" to 1¼" dia.
Place Bolts: ¼" to 1¼" dia.
Structural Bolts to ASTM Specification A325
Tractor Bolts
Special Hot and Cold Headed Parts

Facilities to make larger diameters than listed.

Ask your jobber for CleCap!

Originators of the Kaufman DOUBLE EXTRUSION Process



YOU CAN RELY ON YOUR FAIRBANKS-MORSE FIELD ENGINEER . . .

For Double Dependability in Fire Pumps

Plant fire protection your problem? Call in your Fairbanks-Morse Field Engineer. He's more than a salesman . . . he's an expert in solving pumping problems . . . gives you *double* dependability in the selection of the right fire pump to fit your needs.

FIRST, because he knows pumps and is also familiar with the standards established by your insurance company, he will fit the pump to your job. He has the complete Fairbanks-Morse line to back him up . . . can select the exact pump that will assure the dependability and capacity your plant needs.

SECOND, he has FAIRBANKS-MORSE pumps . . . the most efficient, dependable pumps in the field . . . made by the world's largest manufacturer of pumps.

Why not be sure of the fire pumps you buy by relying on the selection and application assistance of your F-M Field Engineer. For complete details, mail the coupon. Fairbanks, Morse & Co., 3601 Kansas Ave., Kansas City, Kansas.

FAIRBANKS-MORSE

a name worth remembering when you want the best

PUMPS • SCALES • DIESEL LOCOMOTIVES AND ENGINES • ELECTRICAL MACHINERY
RAIL CARS • HOME WATER SERVICE EQUIPMENT • MOWERS • MAGNETOS

FAIRBANKS, MORSE & CO.
Pump Sales Division
3601 Kansas Ave.,
Kansas City, Kansas

Gentlemen:

☐ I would like to have a Field Engineer review my fire pump problems.
☐ Send me informative literature on Fairbanks-Morse Fire Pumps.

Name_____

Company_____

Address_____

City_____ Zone_____ State_____

NEW! For severe impact and heavy loads LINK-BELT presents

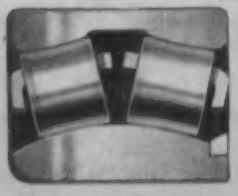
"MILL BEARINGS"

Link-Belt "Mill Bearings" are part of industry's most complete line of ball and roller bearing blocks.

STEEL PILLOW BLOCKS are the answer wherever bearings must withstand great shock and impact loads—as on steel mill, foundry, oil drilling, mining, construction and other heavy-duty equipment. That's why Link-Belt offers this line of Mill Bearings.

Perhaps your bearing demands are less extreme. Whatever your need, you'll find the right answer in this complete line of pillow blocks . . . plus flange, flange-cartridge, cartridge, take-up and hanger blocks and self-aligning roller bearings. Ask your nearest Link-Belt office or authorized stock-carrying distributor for a copy of the helpful 120-page Data Book 2550 on the full line, and 8-page Book 2565-A on Link-Belt "Mill Bearings."

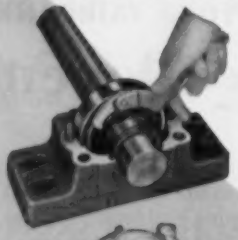
All these important differences are found only in Link-Belt "MILL BEARINGS"



FREE-ROLLING SELF-ALIGNMENT. Adjusts immediately in all directions, assuring full load capacity, even when subjected to shaft deflections and inaccuracies of mounting. Important because "Mill Bearings" are subject to heavy, sudden shock loads.

ONE BASIC HOUSING accommodates either type of seal shown at left. They keep lubricant in and dirt out.

Left, Spiral Labyrinth Steel Seals for heat conditions, oil or grease lubrication. Right, combination felt and synthetic rubber contact type seal for dusty conditions, grease lubrication.



EASY INSTALLATION AND MAINTENANCE. Removal of cap means removal of bolts and hence no interference with assembly and inspection.

SUPER-RUGGED STEEL HOUSING. Four large heat-treated thru-bolts lock with heat-treated alloy steel serrated nuts to firmly clamp cap and base, permitting maximum radial and thrust loads. Big base area supports the bearing and withstands the extremely heavy pounding of mill and other grueling operations.

LINK-BELT

Ball and Roller Bearings

LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 13,710-A

How a shift in gears saved $256,000

Five million MUELLER BRASS CO. forged ring gears improve automatic transmission operation . . . at lower cost to the manufacturer.

Ever since one of the leading manufacturers of automotive transmissions began using ring gears forged from Mueller Brass Co. bearing bronze, production costs have been cut nearly $256,000. That's because the rough forging weighs less and is closer to finished size than a sand cast ring gear formerly used. This shift in gears resulted in a savings in metal costs, greatly reduced machining time and increased tool life. In addition, the use of forged gears has cut scrap loss and eliminated costly inspection rejects.

The performance of these forged ring gears is also far superior to the sand cast gear, which had a tendency to flake away and crack around the teeth, causing failures. More than five million forged ring gears have now been used in these transmissions without a single failure. Being porous, the sand casting was difficult to balance, but the forging has a dense, homogeneous structure that helps keep it in perfect balance.

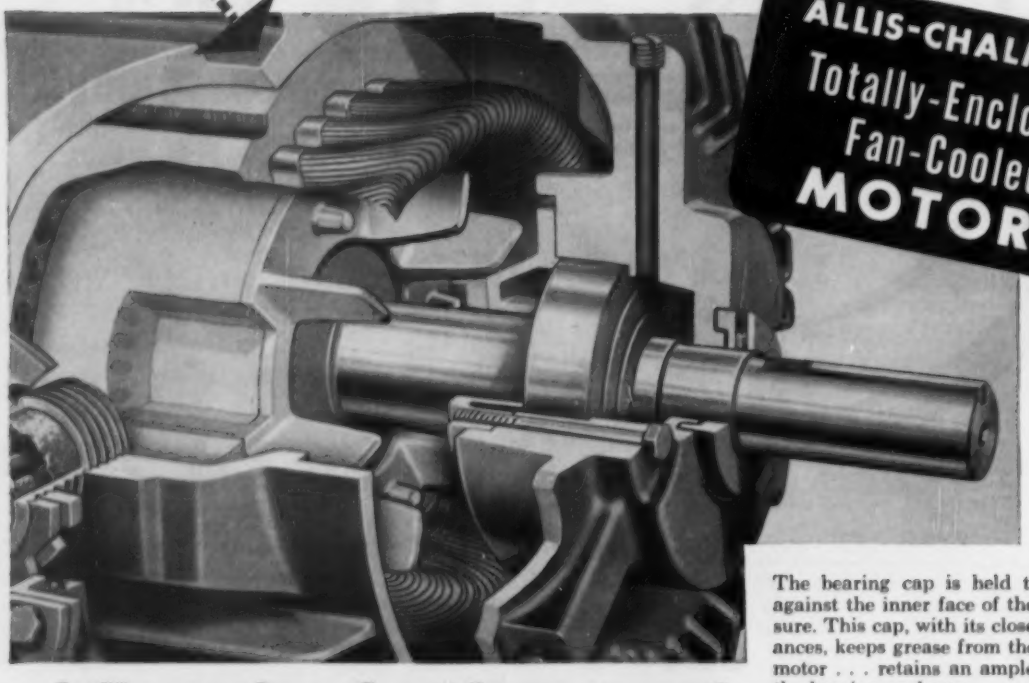
Strong, long-wearing non-ferrous metal parts, forged to your specifications by Mueller Brass Co., can help reduce your costs and improve the performance of your products just as they have done in this transmission application. For complete information, write us today.

Write today for your complete set of Mueller Brass Co. engineering manuals.

MUELLER BRASS CO. PORT HURON 24, MICHIGAN

154

Get Both
bearing features



ALLIS-CHALMERS
Totally-Enclosed Fan-Cooled MOTORS

fully enclosed and protected

The bearing cap is held tightly in place against the inner face of the bearing enclosure. This cap, with its close running clearances, keeps grease from the interior of the motor . . . retains an ample supply within the bearing enclosure.

At the outer side of the bearing, double labyrinth seals keep grease in, also keep dirt out. What's more, large grease reservoirs act as additional dirt traps.

. . . yet easy to grease

You can lubricate the bearings without dismantling the motor. Pipe-tapped holes in the bearing housings at three points provide both means for inserting new grease and a means of flushing out old grease.

Look for the extra bolts on the end housing . . . the sign of greater value. Ask your Allis-Chalmers representative or Authorized Distributor to show you a cutaway section of this maintenance-cutting design. Or write Allis-Chalmers, Milwaukee 1, Wisconsin, for Bulletin 51B7225.

A-4609

ALLIS-CHALMERS

The Iron Age Newsfront

Soluble Vapor Corrosion Inhibitor

A recently developed vapor corrosion inhibitor offers new possibilities in the prevention of rust and corrosion. Working on the migrating gas principle, the inhibitor is completely soluble in all hydrocarbons. It is also reported to be compatible with phenolic resins and can be compounded into xylols or paint thinners.

Military Budget: $35 Billion Annually

Government money going into defense contracts isn't going to be cut in the foreseeable future, despite the Administration's "austerity" program. Look for a continuing military budget of around $35 billion annually for an indefinite period.

Titanium Alloy: Better Impact Strength

Improved impact strength (40 to 50 ft-lb at room temperature) and a notched fatigue endurance ratio in the range of 28 to 32 pct at 10 million cycles, are advantages of a new titanium alloy. Small additions of aluminum have been used to replace less desirable interstitial elements such as oxygen as a strengthener. The powder metal alloy has a tensile strength ranging from 65,000 to 85,000 psi.

Pearlitic Malleable Crankshafts

Rumors persist that two major auto producing divisions will change from forged crankshafts to cast pearlitic malleable crankshafts in their 1956 models.

Stainless Wire: Improved Workability

Restricting the analysis range is reported to have improved corrosion resistance, coiling properties and ability to take sharp bends in a new type 302 stainless steel wire. Uniformity of temper from coil to coil is also reported improved.

Vapor Deposit Hard Moly Coatings

Hard, adherent, wear-resistant coatings of metallic molybdenum can be deposited on titanium alloys without changing the microstructure of the titanium base, a recent study has shown. Vapor deposition methods were used to apply the coatings.

Better Parting Agents Sought

Suppliers of shell mold parting agents are still seeking a foolproof compound which will permit automatic shell mold equipment to operate at peak efficiency. Some users of the process regard this as a major drawback, claiming their production is only a third of potential capacity.

Farm Equipment Steel Demands

Steel buying rate of farm equipment producers is expected to continue high through third and fourth quarters. Reason: Raw steel inventories are very low and bar and plate deliveries from the mill are falling still further behind schedule. Normally third quarter buying falls off, picks up again in fourth quarter for production of spring planting equipment.

Two Moves To Boost LP Gas Use

Two moves are expected to boost use of liquified petroleum gas, a fuel already gaining strongly in industrial acceptance. (1) A long needed directory of refueling stations for propane-butane operated equipment. (2) A series of tests to standardize propane-butane mixtures by latitude. Composition of fuel mixture is dependent on temperatures in which the LP fueled vehicle is operated.

Plastics Tackle Truck Body Market

One trailer maker is successfully marketing an all-purpose plastics truck body kit which includes plastic truck sides, roof, rear, interior lining and cross members. Lighter weight, greater refrigeration insulation, easy maintenance are selling points.

NEWSFRONT · NEWSFRONT · NEWSFRONT · NEWSFRONT

Quantity
PRODUCTION
of
GREY IRON CASTINGS

✻

ONE OF THE NATION'S
LARGEST AND MOST MODERN
PRODUCTION FOUNDRIES

✻

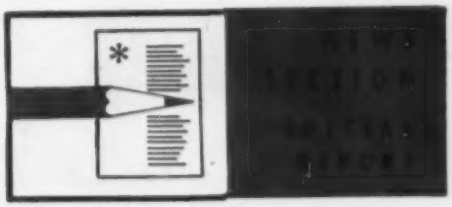
ESTABLISHED 1866

THE WHELAND COMPANY

FOUNDRY DIVISION

MAIN OFFICE AND MANUFACTURING PLANTS

CHATTANOOGA 2, TENNESSEE



BUYERS: The Boom Is Their Problem

Purchasing agents fight shortages, government stockpiling plan . . . Nonferrous shortages loom through 1955 . . . Stockpiling program is defended . . . Long term look at steel advanced—By *R. D. Raddant.*

◆ PURCHASING AGENTS, one of the first groups to anticipate the high tide of business in 1955, now find themselves caught in the full force of its currents.

They are faced with supply shortages, climbing prices, competition from the government stockpile, increased procurement costs, and stepped up production demands which they are trying to meet with less-than-adequate inventories.

And worst of all, they have been forced out of the driver's seat in the continuing give and take between producer and consumer.

All these frustrations were aired in private conversation and in the forum last week at the annual meeting of the National Association of Purchasing Agents in New York, attended by 3000 members.

Upswing Continues

But even to harried purchasing agents, the good side of the booming economy took precedence and they happily forecast a second half as good or better than the excellent first half.

The NAPA business survey committee monthly report shows that 75 pct of the members feel second half '55 will equal or exceed the high levels established in the first half of the year, stated Chester F. Ogden, committee chairman.

At the same time, he pointed out that "there is no demand for goods and services that cannot be satisfied except where labor difficulties curtail supply or military requirements create shortages."

This generally supports most purchasers' private convictions that, although there are serious spot shortages, few problems of supply occur that cannot be surmounted.

Most affected by shortages are purchasers for the metalworking industry. They are faced with inadequate supply of several nonferrous metals, which many PA's blame on government stockpiling, and lengthening backlogs and delays in steel deliveries.

After the stockpile, steel producers were the main sources of purchasers' gripes. The general feeling, with a lot of bitter experience to substantiate it, is that steel companies figured there would be a substantial cut in auto production, and therefore a sharp drop in auto steel demand, in the third quarter.

As a result, purchasers believe steel over-booked for the third quarter, is still taking care of the big auto customers, and smaller consumers will have to wait.

Purchasers are convinced that dropping one month, and in some cases, even two, won't make deliveries current.

In addition, most purchasers are irritated because they believe some steel shortages, plates in particular, are artifical. They know the shortage is not the result of a lack of rolling capacity, but diversion of plates to profitable items like cold-rolled sheets.

However, a long range, con-

What Purchasing Agents Say About . . .

Production

52 pct say May output was greater than April level

New Orders

54 pct say they're up over April

Inventories

Generally on the increase. 32 pct have added to stocks, 19 pct made cutbacks. Inventory buildup is not on a large scale basis but mainly to take care of increased production demands.

Business Outlook

33 pct believe second half '55 will be better than first half. 42 pct expect it to be the same. 25 pct expect slight downtrend because of industry vacations, possible slowing of auto pace, but they aren't looking for a sharp decline. Only 4 pct think second half '55 will be worse than second half '54.

structive approach to the steel problem was advanced by Andrew M. Kennedy, Jr., newly appointed general manager of purchases, Westinghouse Electric Corp., and chairman of NAPA committee on steel.

"A good buyer," he told THE IRON AGE, "should be enough of a businessman to recognize the long range problems of the steel industry. From his viewpoint, the problem is lack of capacity. From the steel industry's viewpoint, it is lack of earnings."

Mr. Kennedy would like to see buyers and sellers of steel in closer relationship, particularly in regard to steel prices. He points out that in the past there has been "no single element" of the public which supports steel price increases.

Talk About Prices

The implication is that steel purchasers, instead of automatically complaining about price increases, should look ahead to the point where adequate profits would assure steel capacity equal to the extreme demands of its consumers.

In exchange, Mr. Kennedy would like to see the steel industry talk more freely about its price structure. He believes that before steel buyers will be able to understand steel's problems, the industry must be "more candid" about its pricing policies.

He believes that if buyers understood steel's pricing policies, under which different products yield varying profits, a long range change in attitude might develop.

Purchasers might be willing to pay higher prices for plate, for example, if they were assured a full supply in times of extreme demand. In other words, they would be paying for "idle capacity" in contrast to present purchasing which frequently results in paying premium prices, relying on costly conversion deals, or facing an uncertain supply situation in times of high production.

This long term look is not apt to be immediately popular with steel purchasers. Many have old scars dating back to the times of extreme shortage. Some of these wounds have been reopened in past months, may be aggravated if third quarter bookings prove to be as much in excess of capacity as many believe.

Blame Stockpiling

The government stockpile program, particularly in nonferrous metals, was blamed by many purchasers as the major contributor to shortages and climbing prices.

Copper users stated flatly that their companies were going to make greater use of copper substitutes if prices continue to hold at present high levels or soar even higher.

"All present indications are that copper will continue in short supply to the end of the year despite the fact that some increases in production of both domestic and foreign copper in the last half of the year are scheduled," stated N. C. Stirewalt, of the Central Illinois Public Service Co., Springfield, Ill.

"I am sure that some feel as I do that we can hardly afford to continue to buy copper at the current price for certain uses," he declared.

N. A. Schowalter, West Bend Aluminum Co., West Bend, Wis., stated: "It is becoming increasingly apparent that current U. S. demand for aluminum, civilian and defense, cannot be met unless there is some relief through defense stockpile relief, further restrictions in the export of aluminum scrap or concentration on the third round of aluminum expansion."

Stockpiling Necessary

"The supply of nickel available to the average user shows practically no improvement," said Harold A. Berry, Ingersoll Kalamazoo Div., Borg-Warner Corp. "The reason for this is that defense-rated orders placed by producers of nickel-bearing products have increased considerably beyond government predictions."

Stockpiling was defended by

A. W. SOELL, director of purchases for Gaylord Container Corp., is new president of national buyers group.

William S. Floyd, assistant director of the Office of Defense Mobilization, in charge of materials, now serving in Washington.

A former purchasing agent himself for Shell Oil Co., Mr. Floyd said that the program, under which 75 strategic and critical materials are being stockpiled, "has not been fully understood and consequently is the subject of certain criticisms."

He pointed out that minimum objectives represent a "rock bottom" defense need. He conceded that payments are occasionally made above market prices, but that an attempt is made to "expand supplies sufficiently so that adequate materials will be available not only for the strategic stockpile but also for the expanding industrial economy of the U. S.

"Since the long term objectives represent an additional margin of defense insurance, we proceed, once the minimum objective has been reached, toward the long term objective by generally procuring material only when it can be done at advantageous prices and when such procurement will also serve to maintain essential elements of the mobilization base that would otherwise be threatened."

This part of the program, he said, has not been fully understood.

GAW: Auto Industry Concedes

Unemployment benefit plan gives workers 60 pct of pay while out of work . . . Three year contract also boosts improvement factor, ups other benefits . . . Employer liability limited—By T. L. Carry.

◆ THE UNITED AUTO WORKERS broke through the guaranteed annual wage front winning from Ford Motor Co. a 26-week, 60 pct of pay unemployment benefit plan.

The so-called "guaranteed semi-annual wage plan" fell short of the UAW's highest goals, but nevertheless opened the door for guaranteed annual wage negotiations throughout all industry, particularly the remaining auto industry now negotiating contracts.

Fixed Cost

Any unemployment payments will not start until June 1, 1956, giving the company time to build up a reserve fund, entirely financed by the employer.

But John Bugas, Ford vice-president and chief of the company's bargaining committee, pointed out that the plan has a definite fixed cost to the company together with a limited liability while retaining flexibility.

Ford agreed to a new 3-year contract with the UAW-CIO covering 140,000 hourly rated employees and ending the possibility of a major strike this year in the auto industry.

$55-Million Fund

Principal feature of the new contract is what Ford calls the supplemental unemployment benefit plan which will give laid-off workers cash benefits which, combined with unemployment compensation, can equal 65 pct of take-home pay during the first 4 weeks.

To finance the plan, the company will make contributions to a trust fund which, based on current levels of employment, could ultimately amount to $55 million. All benefits would be paid from this fund.

The plan agreed upon calls for the company to pay a laid off worker the difference between his unemployment compensation and 65 pct of his take-home pay for a period of four weeks and then revert to 60 pct for another 22-week period. After the company's contributions to the fund have been built up sufficiently, 65 pct payments will be made up to a maximum of 8 weeks in any calendar year, and then the scale will revert to 60 pct.

To finance the plan, Ford agreed to put into the fund 5¢ for every hour an employee worked beginning on June 1, 1955.

Other agreements reached by the company and the union are:

1. An increased annual improvement factor of 6¢ or 2½ pct, whichever is greater.

2. A liberalized pension plan under which a worker who retires after 35 years could receive $235 a month, including his own and his wife's social security.

3. A plan that gives 2½ weeks paid vacation to a worker with 10-15 years seniority.

4. An additional paid holiday which is split with half being taken on Christmas Eve and the other half on New Year's Eve.

5. Triple pay for holidays except for workers who are on a regular 7-day schedule or who are employed in Ford's Steel Div.

6. Wage increases for workers in skilled classifications.

7. Increased employee-insurance benefits, chief of which is the inclusion of eligible employees wives and dependent children in the in-hospital medical benefits.

It Happened!

▪ Ford Motor Co. has agreed to the principle of company unemployment payments when a worker has been laid off. This agreement with union demands ranks alongside early unionization of industry in its importance. Its impact will go much further and will surpass the impact of non-contributory pensions.

▪ This move was forecast by THE IRON AGE, Mar. 24, 1955, p. 65: "The automakers will give the union a highly watered down version of the guaranteed annual wage. It will be enough so that Reuther can claim victory, but limited enough so that automakers can say they really didn't give in on GAW—that all the union won was a mild kind of company unemployment insurance."

▪ On April 14, THE IRON AGE said: "Automotive workers will receive some kind of an inflated or liberal unemployment plan which, with a little stretch of the imagination, could be called a guaranteed annual wage—or else they will get a commitment that they will get it after details are worked out."

▪ On April 28, THE IRON AGE said: "Qualified observers of the labor scene, shifting out the bombast and the window dressing, believe that GAW 'in a modified form' will emerge from the Detroit talks."

RAILROADS: GM Builds Super Trains

Electro-Motive, GMC work on two Trains of Tomorrow . . . Steel and aluminum units will be shown in late summer . . . Many new features in secret projects . . . May go into operation—*By W. G. Patton and T. L. Carry.*

◆ ELECTRO-MOTIVE and GMC Truck and Coach Divisions of General Motors are pooling their engineering and manufacturing resources in construction of two new Trains of Tomorrow.

First of two 10-new units will be shown to the public at the GM Powerama scheduled to open in Chicago on Aug. 31, it was learned by THE IRON AGE.

Capacity of the new steel-and-aluminum passenger cars is 40 persons. The cars are 37½ ft long.

Sources report the steel understructure of the new cars is being built at the Electro-Motive Div., La Grange, Ill. The superstructure which is being completed at the Pontiac Plant of GMC Truck and Coach Div. is said to follow many of the construction details of GM buses.

New Features

While many design and engineering details are not available, the new coaches are known not to be light weight construction.

A new type air suspension unit will be used, featuring individually suspended wheels from a stub axle. Each car will have four wheels rather than the 4-wheel truck construction used in conventional railroad cars.

Steel will be used for the underframe construction. Aluminum superstructure will be employed, according to available information.

Extensive tests of the underframe have been conducted at the La Grange Plant of Electro-motive Div., it is reported.

Fancy Styling

As in the case of the first GM Train of Tomorrow introduced in 1947, many of the interior details of the new train were designed by the GM styling section.

An unconfirmed report indicates that at least one of the new trains may be used experimentally by the Pennsylvania Railroad after it has been publicly shown by General Motors.

The first GM Train of Tomorrow was an experimental project to try out advanced ideas for the improvement of railway travel. The train was powered by a GM diesel locomotive; passenger cars were built by the Pullman Standard Mfg. Co. Before designing its first train of tomorrow, GM styling section sent its design experts to ride trains for several months, making notes on the things that the traveling public might like.

Not in the Business

Among the engineering features of the earlier GM design were outside-hung swing hangers for car trucks, roller bearing journal boxes, and synthetic rubber mountings. The trains also featured air conditioning, new type heating and ventilating system, and a "power package" designed to permit each car to be uncoupled without loss of heat, light and refrigeration. The earlier cars featured an astra dome. Recently, this idea has been further developed by GMC for its Scenicruiser.

GM has denied on several occasions that the company has any intention of going into the railroad car business.

"Don't bother your father, dear, he's on vacation."

Shipping:

Steamship head calls for exchange of ideas on shipping.

A clearing house for the exchange of ideas and methods to strengthen world shipping is called for by Rear Admiral Glenn B. Davis (USN Ret.), president of U. S. Steel's Isthmian Steamship Co.

Admiral Davis proposes closer coordination between the steamship companies and such segments of international trade as those who buy and sell in the export-import market, railroads, freight forwarders, banks and insurance companies, as well as labor.

"It is not beyond our collective capacity to set up the means of transmitting constructive ideas of one member of the relay team of world commerce to other members to whom those ideas might be helpful," says Admiral Davis.

The shipping companies, Admiral Davis said, "feel keenly a sense of responsibility for helping to develop world trade."

Army Diesel Contract

Consolidated Diesel Electric Corp., Stamford, Conn., has received a new $2,437,546 contract from the U. S. Army Corps of Engineers for a quantity of 60 kw diesel driven generator sets.

Lake Bottom Ore Project

◆ TWO GIANT barges that will move an estimated 160,000,000 cu yd of Canadian glacial silt began tearing the cover from Inland Steel's Steep Rock ore property recently. The silt removal work alone will be a night and day project until 1960, will open the way for an ore property capable of producing 3,000,000 annual tons by 1969.

The two dredges, biggest in the business thus far, will work through the Canadian winter, with two diesel tugs breaking ice around the dredges as it forms. Cracked ice will be stacked out of the way and the dredging operation will continue without a break. Six electric motors of 10,000 hp each will pump 60,000 gal of water per min containing about 15-20 pct lake bottom silt.

The heavy dredges were built by Construction Aggregates Corp. at the site. Parts were hauled by rail and truck to the Atikokan, Western Ontario, location. Total content of the lake will be removed 12 times before dredging is complete. The ore body bared by the silt and water removal will be mined, using both open pit and shaft mining.

Inland engineers have been pumping the lake since March, and one dredge began moving silt in May. At least some ore will be produced and stockpiled during 1958 and 1959, but shipments of ore from the property will follow the completion of rail facilities in 1960.

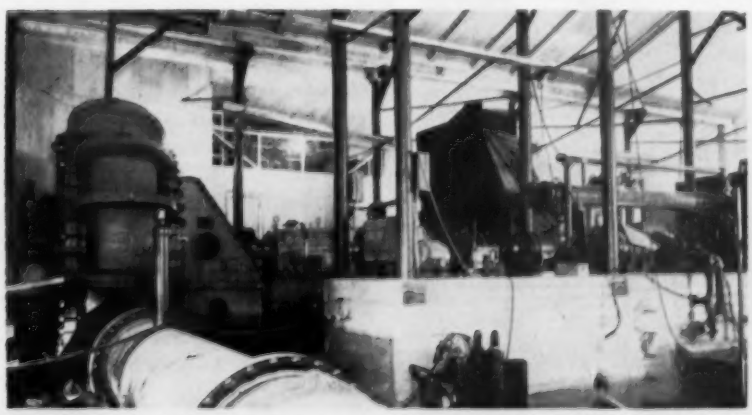
Hold 99-Year Lease

Each dredge line consists of a barge mounting a 10,000 hp motor, followed by a booster barge of smaller size on which a second 10,000 hp motor is mounted. A third motor of 10,000 hp is mounted on shore for each line.

At least 200 ft of silt will have to be removed from the lake bed before a working entrance to the ore body will be fully opened. Initial operations have consisted largely of cutting away the top edges of the silt filling the hard rock basin in which the lake lies.

Steep Rock Iron Mines, Ltd., hold about 7000 acres of the lake property and Inland Steel Co. holds a 99-year lease on roughly 1200 acres on the lake.

HEAVY equipment is brought into play in the transfer of dredge spud to job scene. Wintry weather will be no deterrent to dredging operation.



MAGNITUDE of the ore recovery project is indicated by the size of inshore booster pumping installation. One of these shore stations backs up each dredge line. At least 200 ft of silt will be pumped to expose ore body.

RIGGER swings in mid-air as second spud on the *C. B. Randall* is installed at lake dredging site.

DISTRIBUTION

FREIGHT: More Metal Moving by Air

Air freight business is up 25 pct over '54 . . . Many firms willing to pay higher cost for quick delivery . . . Air freight cuts rejects, eases field inventory problem . . . Rates coming down—*By T. M. Rohan.*

◆ "WE'RE SHIPPING titanium regularly overnight from Nevada to Pittsburgh," Flying Tigers freight agent in Cleveland said. "We're also flying 120 in. long titanium sheets and forgings out to California aircraft plants. And we fly auto doors, fenders and tailpipes regularly from Ohio auto body stamping plants to assembly plants all over the country. We're also carrying landing gears made in Cleveland out to the Coast on a regular schedule."

With heavy tonnage, regular shipments like this, air freight business in 1955 is up at least 25 pct nationally over the first 4 months of 1954, and it's still climbing.

Willing to Pay for Speed

Center of air machinery shipments in the U. S. is Cleveland, from where almost 1300 tons of machinery were flown out by United Airlines alone last year. And the airline estimates air shipments of all types of goods in the area are up 38 pct in the first 4 months of this year compared with the same period '54.

Many firms are apparently willing to pay the higher cost of air freight to get speedier delivery. Boeing Airplane Co. in Seattle, for example, regularly lays out $80 more per planeload to gain 6 days' delivery time on shipments of Jet engine parts from Thompson Products at Cleveland. The 500 lb lots cost $21 per 100 lb by air freight, but reach Boeing within 2 days, compared with $5 per 100 lb by truck in 8 days.

Thompson Products is currently sending and receiving 18 tons of parts each month by air in hundreds of shipments to meet emergencies and "tomorrow's too late" delivery dates.

Air cargo service has improved tremendously in recent years as a result of stiff competition. Rates in some cases are even getting close to truck and rail freight charges. A 150 lb package can be air shipped from Cleveland to New York for $11.25, including city pickup and delivery, compared with $10.82 Railway Express. Air delivery is overnight while Railway Express takes about 2 days.

Space Reserved in Minutes

Under a new system started by United Airlines, you can now reserve space ahead on flights to a given destination so the customer at the other end can time his pickup and production schedules. Reservations are cleared in a matter of minutes by direct wire to the Denver clearing house. Much air freight formerly went on a space available basis.

A new facsimile system being investigated by United will transmit complete information on cargo shipments direct to the destination before it leaves. At present, the phone number of the party receiving shipment may be attached to waybills for notification on landing.

At least three firms in Cleveland do a lively business in freight forwarding by consolidating shipments to get lower rates. They pick up and deliver at both ends on regular scheduled truck routes and take full responsibility as freight forwarders.

Air Freight Cuts Rejects

New DC-7's will carry up to 9000 lb of freight plus 58 passen-

FLYING TIGER air freighter delivers the goods, a 1-ton steel processing tank, in record time. Many types of steel and iron products fly today.

gers. A shipment can leave Cleveland at 1:45 p.m. (E.D.T.) and arrive in San Francisco at 7:20 p.m. (P.D.T.). Air freight men as a rule of thumb, however, offer next day delivery within a 1000 mile radius and "second day" service over 1000 miles. They can also move over weekends, unlike most trucking firms.

Cuts Rejects

Some wide-awake Cleveland metalworking firms are finding air freight a convenient way to minimize rejects on experimental runs of new parts or products. The first batch off the line is shipped by air to the customer for inspection and the remainder held for his OK.

Field inventories are also cut down by fast shipment. Republic Steel, for example, ships huge Euclid truck tires by Pan American to its mines in Liberia in 28 hours. The freight costs more than the tire but air delivery eliminates the problem of field stocks.

Packaging costs, too, are reduced for air shipment because vibration and jarring is less and exposure to the weather almost nil. Air cargo lines currently are starting major promotions on this theme to increase their share of the market.

Push Space Selling

With the vast increase in the last few years, in passenger traffic, more planes have been put on which means more cargo space is available. Airlines traffic men figure that at present no more than 30 pct of freight space is being used. With overhead more or less fixed whether planes are empty or full, the airlines are making a concerted drive to get more freight.

Rail Carloadings Rise

Loadings of revenue freight for the week ended May 28 totaled 790,176 cars, the Association of American Railroads announces. This was an increase of 100,884 cars or 14.6 pct above the corresponding week in 1954, and an increase of 3421 cars or four-tenths of one pct above the corresponding week in 1953. Revenue freight loadings increased 15,757 cars.

RESEARCH

Taking the Tin Out of Tin Cans

◆ TAKING THE TIN out of America's 36.5 billion cans was the subject of some serious talk at the opening of American Can Company's new research and development center in Barrington, Ill. Canco president William G. Stolk predicted a high percentage of tinless cans within 10 years. Elimination of tin was named No. 1 long-range research project of the can company.

Research on chemically treated but tinless steels is already well underway at the new center and the company is working on soldering methods that would permit use of these steels in high speed manufacture. Rapid welding techniques and organic cements are also under development for seam closure.

Availability and cost make steel a strong bidder for use in future containers but aluminum alloys, aluminum coated steels, zinc, nickel and even titanium are also being considered. Conventional aluminum-clad steel as well as electroplated and vapor deposited stock are being used experimentally.

Solid tinplate bookings indicate the switch to other materials is not an immediate steel mill worry but a brochure on the new laboratory offered this thought: Yesterday's beer can required 3 lb of tin per 1000 cans. Today it's ½ lb for the same quantity using 6.4 billion cases.

RAPID ANALYSIS of metals and checking metal traces in food are jobs of this emission spectroscope at American Can Co.'s new research center.

CAN-MAKING line at Barrington, Ill., research center simulates production conditions, permits testing of experimental cans by American Can Co.

MARKETING

APPLIANCES: They Need More Steel

Carryovers and product shortages harass buyers . . . Sales are good and retail inventories are not high . . . Manufacturers are running as much as 40 pct over 1954 . . . Second half looks good—*By K. M. Bennett.*

◆ IS THE APPLIANCE industry buying too much steel? Is it piling up inventories of finished goods, as in late 1953 and early 1954?

Veteran steel suppliers were asking these questions last week, and for three good reasons: the stiff pace of current steel buying by the appliance industry; its willingness to book substantial tonnages of steel through third quarter and into fourth; and the astronomical output of finished appliances.

The answer apparently is no. The appliance steel buyer is buying all the steel he can get, but it's not enough.

With mill carryovers running conservatively from 17 to 45 days (as much as 60 days in extreme cases) no appliance man has the steel he would like to have in inventory. And his finished goods sales are strong. The raw material inventories that looked ample back in January are running low in the face of a higher consumer demand for appliances than had been expected, and as steel deliveries continue to lag further behind originally scheduled delivery dates.

Sales Are Strong

A pileup of finished appliances in warehouses and distributors' shops always means a curtailment of steel and components buying by the appliance manufacturer. But his present retail sales are strong. Washers, dryers, and ironers (ranking about one-third of 1954 total appliance sales or $1,033,537,442 of a total of $3,081,439,942 spent by Mrs. America for appliances last year) went on to an all-time first quarter high this year. That is 1,443,858 units as compared with 1,076,493 in first quarter 1954, a 34 pct gain, or 144,000 tons of steel as compared with 107,000 tons one year ago.

Individual companies scored even stronger gains. Maytag, for instance, reports a 42 pct advance over the year ago period to hit record first quarter. Hotpoint, General Electric subsidiary, was somewhere in the neighborhood of 39 pct over a year ago, after a record first quarter and a record March. International Harvester, builder of trucks, farm equipment, and a growing line of home refrigerator and deep freeze models, in the six month period ending April 30 was doing $50 million better than it had in the same period one year ago. Westinghouse completed a record first quarter, reported a 25 pct advance in heavy appliance sales over the year ago first quarter, with 16 pct in refrigerators alone.

Schedules Increase

Figuring 10 appliances per ton of steel, it's still a lot of steel. An appliance maker who used 100,000 tons of steel in his best year, is currently consuming 27,000 tons per quarter and will hold that rate for the year. A stove manufacturer who is buying about 35 pct more steel than at this time one year ago (business wasn't that bad, raw steel inventory was being reduced) expects to do his best business in second half of this year, is currently 12.9 pct over sales one year ago, and has a three week finished goods inventory that must be built to five weeks before his heavy selling season begins.

Appliance sales are good. The problem in many cases is that they are even better than hoped for. One purchasing agent admits revising his buying schedule upward three times since the beginning of the year, is still stretching for steel. Though galvanized sheet, enameling iron, and cold-rolled sheet are still the toughest items on the appliance purchasing agent's list, bar carryovers have moved in the past 30 days out to four weeks and hot-rolled is almost as difficult as cold-rolled sheet. May production is down in some cases.

ROTARY inspection cycle at Maytag plant, Newton, Mass., puts 66 washers at a time through wattage, water level check of all mechanisms.

STOCKS: Wall St. Comes to Main St.

Nation's first How-to-Invest Show helps unveil "mystery" in investment field . . . 100,000 Main Streeters see how stocks aid corporate growth . . . Steel industry among exhibitors—*By D. G. Picinich.*

◆ WALL STREET came to Main St. as the nation's first How-to-Invest Show held recently in New York City helped dispel for an estimated 100,000 visitors the mysteries of buying a share of American industry.

Sponsored by a leading Stock Exchange member in cooperation with eight large industrial and trade groups—including the steel industry—the exhibit cost almost $1 million, took nearly a year to prepare. Objective: to tell more people more things about investments.

Mixing a potpourri of runway showmanship with carefully planned displays, exhibitors showed potential investors from 6 to 60 the highlight facts in the nation's financial growth since colonial times — emphasizing how today's investors can share in an even brighter industry future.

Millions Own Stock

In 1800, for example, U. S. population totaled 5.3 million, investments amounted to $200 million, income was about $677 million.

Today, with a population of around 163 million, investments in industry come to $460 billion, with income estimated at $254 billion.

To answer its own question, "Who are investors," one display pointed out that more than 6.5 million people own stock today. Almost one-third earn less than $5000, while over three-fourths earn less than $10,000 a year.

At Youngstown Sheet & Tube Co.'s hot strip mill exhibit, visitors were given a spotlight rundown on today's steel industry vital statistics. Listings reported 770,000 stockholders with total investments of $9 billion and sales totaling $11 billion among the nation's 255 producing companies.

In a pocket-size brochure, American Iron & Steel Institute told readers that from 1929-1954, steelmaking capacity increased 76 pct to 126 million tons annually. Gross income was 231 pct higher, while total dividends to investors rose 70 pct.

During the last 8 years alone, AISI noted, steel production capacity has risen 38 pct—has increased three times faster than population since 1900. Over the past decade, dividends have averaged about 3 pct a year on gross income.

Blue Chip Profits

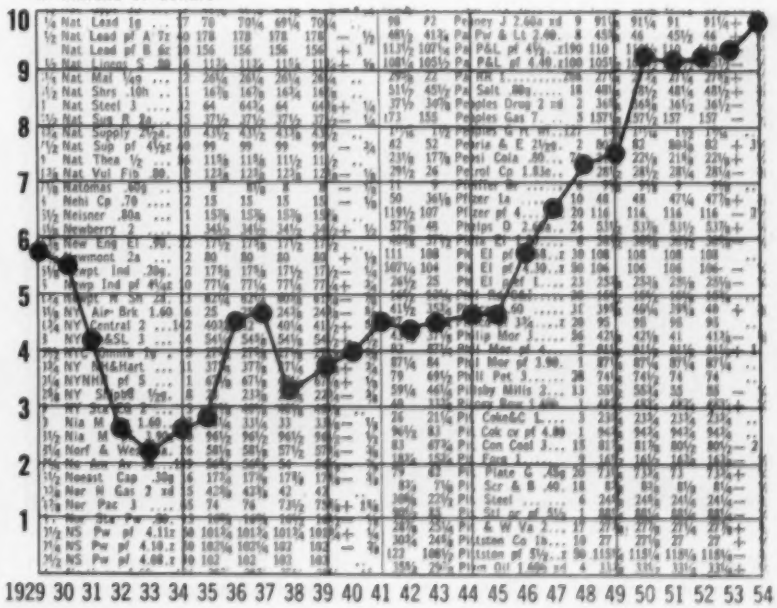
International Business Machine's automatic calculator told visitors in 6 seconds how much they might have made had they invested, say, $500 a year in any one of a dozen "blue chip."

Score card for U. S. Steel Corp. common stock, for example, beginning with 1929 through May 20, 1955, showed: (1) 597 shares owned (2) total cost of shares bought $13,580.90 (3) current value $49,998.75 (4) total dividends received $16,484.09 (5) total dividends plus present investment in stock $66,482.84 and (6) net gain $52,901.94.

Compounding caution with optimism, show sponsors suggested would-be investors analyze their own financial status with self replies to three questions: (1) can you cover present expenses comfortably, (2) do you have adequate insurance, (3) do you have enough savings to meet emergencies? If the answer is "yes" to all three—then, say the experts, you should consider investing in part ownership of American industry.

Dividend Payments Made by Corporations

In billions of dollars



MACHINABILITY: Computor Tells All

New electronic device figures tool life different settings will give . . . Unit considers 19 machining variables, solves special machining problems . . . Cuts guesswork, lengthy calculations.

◆ ELECTRONIC magic now figures the best way to set up a machining operation. A new General Electric computor considers 19 significant machining factors, computes tool life or other values from combinations of known variables.

Designed to reduce engineering calculations and shop guesswork, the computor can be operated by untrained men, solves problems in 2 minutes where several hours were needed before. Turning, milling and drilling computations are made. In practical applications any one of 13 variables can be entered.

Solves Special Problems

The device can come up with different machining elements but biggest use will probably be in determining conditions of longest tool life. Computor tells how a tool is affected by changes in feed, depth of cut, material hardness etc. It indicates the combination easiest on the tool. In one problem the computor revealed that slight changes in tool material or feed rate might increase tool life as much as 75 minutes.

Tells What Counts

Determining horsepower requirements and investigation of special machining problems are other functions of the unit. In one special application, a shop was using 175 fpm, 0.0125 in. feed to remove 3.1 cu ft of metal per minute. On the basis of computor findings, 460 fpm, 0.025 in. feed was adopted. Rate of metal removal increased to 16.0 cu ft per minute.

The computor is not intended as a cure-all for machining problems. Calculations cannot be made under conditions where tool breakage or chipping occur. Reliable data must be fed in. But the unit does provide three services very vital to machine performance and life.

First, it identifies significant machining factors. Dr. W. W. Gilbert of General Electric's Manufacturing Services Div. developed the computor after examining hundreds of University of Michigan machinability studies. On the basis of this data the computor was built to consider the 19 most important variables, including type of tool, speed, diameter, rpm, feed, depth of cut, tool life, material hardness, microstructure, surface condition, tool profile, flank wear land, and cutting fluid.

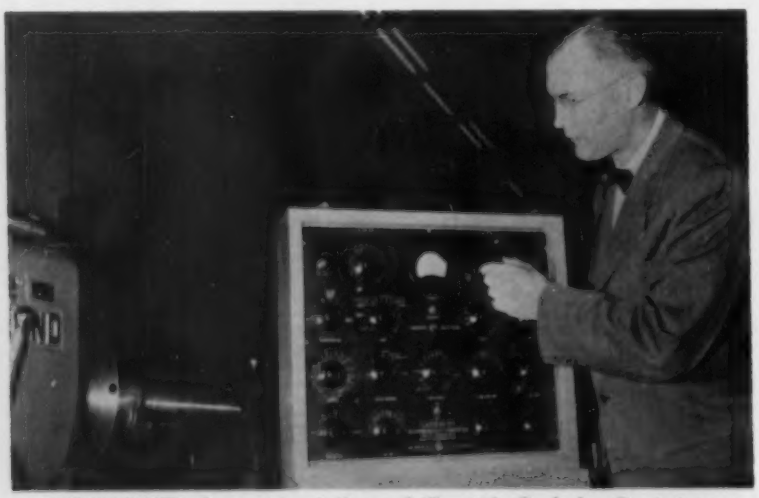
Works Fast

Secondly, the unit gives proper weight to each variable. A complex network of relationships, representing stacks of research studies and handbooks, is hooked together in one 32 lb device.

Thirdly the computor acts with electronic wizardry and speed in solving practical problems. Taking the place of slide rules, tables and long hours of computation, it tells how changes in one or more machining factors will affect related variables.

Manufactured by General Electric's instrument department at Lynn, Mass. the computor will sell for $500, is scheduled for Aug. 1 deliveries. The unit has been field-tested for over a year by General Electric. First public showing was at the Carboloy Dept., Detroit.

With machine investment running higher and higher, downtime for tool changes becomes more expensive every day. Exact calculating devices seem destined for wider use as trial and error tests become more costly.



MACHINABILITY Computor of General Electric's Carboloy Dept. is operated by Dr. W. W. Gilbert, who developed new device. Computor considers 19 variables, figures tool life or other values for different conditions.

MISSILES: Nikes Stand Guard

DEATH REHEARSAL: Nike launching crew scrambles to stations in practice alert at Lorton, Va., site.

◆ ENEMY planes head for a big U. S. city. Word is flashed to the Nike battery guarding the city and a deadly team swings into action.

First the search radar of the Nike control station scans the sky. The formation is picked up still far off. A tracking radar tunes in on the attackers and begins cranking range dope into the battery computer. The missile tracking radar trains on Nike.

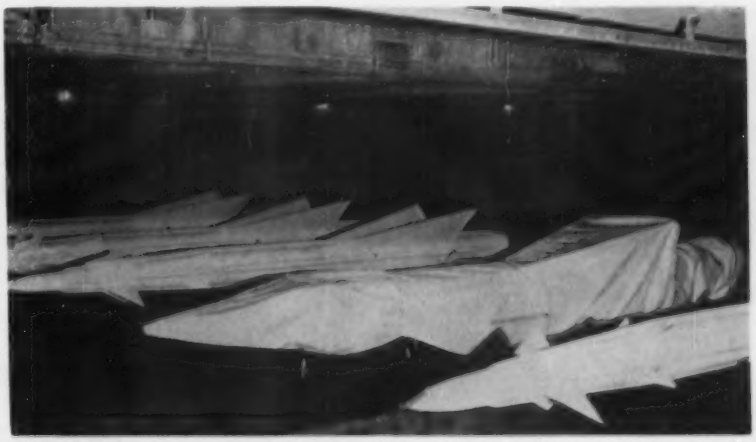
At the right moment, the missile is launched. A 20 ft, liquid fueled device, Nike takes off from an almost vertical position, meets attacks from any direction.

Once up to speed, Nike sheds a booster device and heads for the target, traveling faster than sound. Ground control uses radar data to keep the missile hard after maneuvering targets. Nike hits home.

That's the Nike story and it's all real except for the enemy's appearance. Nike emplacements are deployed throughout the U. S. Trained crews stand 24 hr watch. Product of service-industry development, Nike batteries form an inner ring of U. S. defense.

SLEEK NIKES are pointed skyward, ready for ground-controlled flight against attack from any sector.

CONCRETE magazine houses Nikes and launching racks for the guided missiles. Spotted in key U. S. areas, launching dugouts are part of Nike systems that include radars, computers, plotters and generators.



NIKE NEST sits quietly in underground launcher. Missile at right is on rack, ready for quick raising to firing angle. The 20 ft Nikes weigh a ton with booster. Fins steer path to target on directions from ground.

EXPANSION IN INDUSTRY

BAY AREA where electric lifting magnets are produced in Electric Controller & Manufacturing Co.'s new $4.5 million plant opened in Cleveland recently. Flexibility was the key word in construction. As designs change and product demands dictate, whole departments can be moved at low cost.

DIXON-YATES: Ground breaking for $107,250,000 generating plant sees Edgar H. Dixon (left), Mid-South Utilities president, and Eugene A. Yates, Southern Co. board chairman, using gold plated shovels.

Aluminum:

Kaiser investing $750,000 in West Coast casting facilities.

Ingot casting facilities costing approximately $750,000 are being installed at Kaiser Aluminum & Chemical Corp.'s reduction plant at Mead, Wash. The project is slated for completion late this year.

The casting facilities, using the direct chill method, will supply 5000-lb ingots for the company's nearby Trentwood sheet and plate rolling mill and other customers.

Although the new unit will provide an end product in a new form for Mead, it will not enlarge plant output, which has a capacity of 175,000 tons of primary aluminum a year.

The new installation will supplement part of the Trentwood plant's remelt and casting facilities, contributing to reduction of melting losses, fuel requirements and metal handling.

Add Tube Facility

Construction is slated to begin shortly on a new seamless tube mill at Youngstown Sheet & Tube Co.'s Indiana Harbor Works, Chicago.

Pipe produced in the new facility will range from 4½ to 9⅝-in. OD. Output is slated primarily for use in the oil fields. The new mill will cover more than 400,000 sq ft.

The company's present tubular facilities in the Chicago area include two continuous buttweld pipe mills, an electric weld mechanical tubing mill and a conduit department.

In addition to the new tube installation, ground was broken recently at the site for a new, multimillion dollar tinplate mill.

Open Second Furnace

Tennessee Products & Chemical Corp., Nashville, has reopened its second blast furnace at Rockwood, Tenn. The furnace had been shut down since late 1953.

The company, recently acquired by Merritt-Chapman & Scott Corp., operates 13 plants throughout the South which produce metallurgical products, chemicals, fuels and building materials.

WYANDOTTE ANNOUNCES

a superior electrocleaner for nonferrous metals in automatics or hand lines

Laboratory and production tests prove that Wyandotte's new electrocleaner, LECTRITE-NF, improves results, cuts costs! It does an outstanding job on nonferrous metals, especially brass, and provides the following advantages:

INHIBITED

to prevent etching, staining, excessive oxidation, clouded plate — during cleaning as well as in long transfers.

FORTIFIED

for exceptionally high detergency, soil tolerance, and long use-life which insures lower use-cost for you.

BALANCED

for fast and complete wetting, free rinsing, controlled foam blanket which assures uniform, more efficient processing.

VERSATILE

New LECTRITE-NF is effective in hard or soft water, on brass, copper, copper alloys, zinc-base diecastings, and other special alloys. For single-tank reverse-current electrocleaning, or where two-stage direct and reverse cleaning is employed.

Wyandotte offers a complete line of performance-proved metal cleaners, phosphatizers, paint strippers, and related products. Each is specially prepared to give optimum results at lowest use-cost. Write today, stating your metal-cleaning problem or application, for complete facts and demonstration. *Wyandotte Chemicals Corporation, Wyandotte, Mich. Also Los Nietos, Calif.*

Wyandotte
REG. U. S. PAT. OFF.
CHEMICALS

Helpful service representatives in 138 cities in the United States and Canada

MAIL NOW FOR DATA AND DEMONSTRATION

Wyandotte Chemicals Corporation, Dept. 2300
Wyandotte, Michigan

☐ Send more data on the use of new LECTRITE-NF.

☐ Have representative call.

Name_____

Firm_____

Address_____

City_____ Zone____ State_____

You get the machining qualities you want when you use J&L's LEADED STEEL BARS

1. FASTER MACHINABILITY . . . because with J&L's Leaded Steels much higher cutting speeds are possible.

2. INCREASED TOOL LIFE . . . because the lead addition in J&L's Leaded Steels lowers the coefficient of friction—thereby reducing the heat that develops in the cutting edges of tools.

3. IMPROVED SURFACE FINISHES . . . because J&L's Leaded Steels machine to fine surface finishes.

4. LOWER OVER-ALL COSTS . . . because the free-cutting qualities of J&L's Leaded Steels boost production and, at the same time, reduce part rejections.

Phone the J&L District office or Warehouse nearest you.

J&L STEEL

Jones & Laughlin
STEEL CORPORATION
Pittsburgh 30, Pa.

Report To Management

Capital Expenditures Take Over

Up to this point, consumer expenditures have carried the ball in the 1955 recovery. Capital expenditures have lagged behind while consumer buying has raised the Gross National Product to record levels.

The stage is now set for a broadening base of spending, with new emphasis on plants and equipment and other durable goods. Any second half slack in consumer buying will be made up in new capital outlays.

It will be a healthy factor in the economy which has tended to be top heavy in the earlier months of the year. Too large a share of the first half spending can be traced directly to two sources, automotive and construction.

Total capital spending by manufacturing companies is expected to be down for the year. But all surveys indicate that it will be concentrated in the second half of the year and actually started to pick up in the second quarter.

What's behind the change in capital programs isn't hard to pin down. New confidence generated by the high rate of consumer buying is a big factor, perhaps the most important. Boom psychology has a chain reaction.

There are also sound economic reasons. They include higher profits after taxes, accelerated depreciation, and the need for new and improved equipment to handle the increased production demanded in most industries.

How's Your Management Pay?

If you are in the "middle management" bracket of your company, your annual pay should be about $11,200. If it isn't either you are below average or your company's pay scale isn't up to par.

Most American companies report they pay their people between the policy making level and general foreman category between $7000 and $14,900, according to a survey conducted by the American Management Assn.

Salaries vary according to responsibility but not so much according to geography. Scales are remarkably similar in all sections of the country. If you are eligible for a fat bonus or stock option plan, you are lucky. Only 36 pct of the group have that advantage.

More Paychecks Are Coming

Employment is on the rise at last. This weak point in the economic structure strengthened significantly during the past 2 months with factory employment setting the pace.

This is more encouraging in that the spring upsurge is in contrast to the conventional downward trend that usually occurs in the spring months.

Manufacturing employment increase of 40,000 in April marked the first time since 1950 and second time following World War II that factory job total gained between March and April.

Metalworking set the pace in employment gains. Primary metals group in U. S. Dept. of Labor breakdown added about 23,000 workers during the month, largest March to April rise since 1950. Total increase since January for this group was 71,000.

Other big employment gains occurred in machinery, 22,000, and transportation including automotive, 17,000. Durable goods employment gained about 88,000 altogether, but this was partly offset by a decline of 47,000 in nondurable goods plants.

Nonfarm employment has gained about 900,000 since the first of the year, close to the record postwar rise of 1 million in 1950.

INDUSTRIAL BRIEFS

Assembly Contracts . . . TEMCO Aircraft Corp., Dallas, has been awarded a subcontract to build large quantities of three separate assemblies for the North American F-100D Super Sabre. Work will be performed at TEMCO's Garland plant.

Electronic Pilot Line . . . The National Bureau of Standards pilot line for the mechanized production of electronic equipment will be operated by Aerovox Corp., New Bedford, Mass., manufacturers of electronic components. The line automatically produces electronic products based on a unique system of electronic modular design.

New Furnace . . . Barium Steel Corp. has obtaind exclusive rights to manufacture and market a new type of furnace to produce hot metal to replace pig iron for steel producing and foundry use. A unit has been installed at their Central Iron & Steel Co. plant at Harrisburg, Pa.

Flame Spray Ceramics . . . Continental Coatings Corp. of Illinois has signed an exclusive license agreement with Armour Research Foundation of Illinois Institute of Technology to use the latter's patents in "Flame Spray Ceramics" in the service contract applicator field.

Addition . . . Sales Service Machine Tool Co. of St. Paul, Minn., has been named to handle sales for Hydra-Feed Machine Tool Corp. in Minnesota, western Wisconsin, and North and South Dakota. The recent addition of a line of tracer controlled lathes embodying many of the features that make the automatic lathes pacesetters in production machining, has broadened the field for Hydra-Feed and resulted in expansion of its sales organization.

Expansion . . . Superior Tube Company of Norristown, Pa., has acquired a majority interest in Johnson & Hoffman Manufacturing Corp., Mineola, Long Island, N. Y., manufacturers of precision stamping and deep-drawn parts, primarily for the electronics industry.

Modernization . . . A three million dollar modernization and expansion program has been announced by the Chardon Rubber Company, a subsidiary of Ball Bros. Co. of Muncie, Ind. All rubber manufacturing activities and facilities formerly operated at Muncie will be transferred to Chardon. All departments will be modernized and rearranged for streamlined flow of materials.

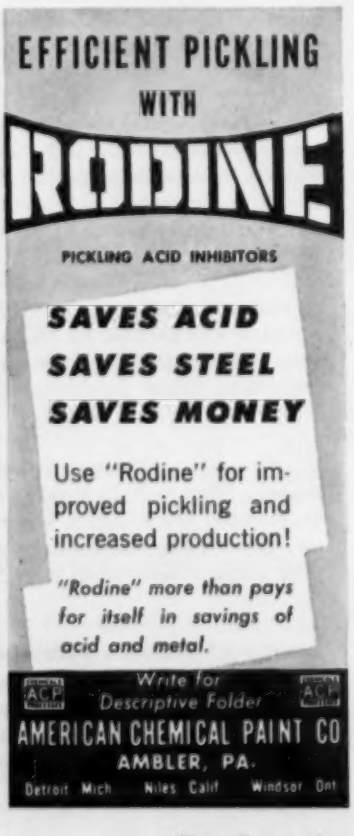
New Representative . . . Barker Industrial Equipment, Ltd., Toronto, Can., will serve as the exclusive sales and service representatives for all the Canadian Provinces for Michigan Drill Head Co., Detroit.

Kilowatt Unit . . . The General Electric Co. has received an order from the Consolidated Edison Co. of New York for a 300,000 kilowatt steam turbine generator. The unit will be the largest yet manufactured by the company, and also one of the most powerful in the world.

Expansions . . . Lukens Steel Co. has added two organization developments in its metallurgical and research programs. The first is a Metallurgical Development Division, which will be responsible for improvements in steel processing methods. The second is the Research Division, which will be responsible for the development of new metallurgical and chemical products and processes in steelmaking.

New Tool Plans . . . Regional sales managers of Byron Jackson Co.'s Oil Tool Division got a preview of some important new tool developments during a recent sales conference in Los Angeles. The new developments in oil tools will lead to even greater safety and increased speed.

Sales Representative . . . O'Connor & Co., Inc., of Chicago, will act as western sales representative for the Hale & Kullgren, Inc., of Akron, Ohio. The concern will handle machinery sales of the National Erie line, including extruders, presses, mill and Banbury repair service. Hale & Kullgren are designers of machinery.



Delpark OFFERS A COMPLETE LINE OF

Filtration Equipment For Industry

Your Delpark representative has the complete line of equipment plus engineering to solve your filtration problems.

FAMOUS DELPARK DISPOSABLE MEDIA FILTER

For filtration of coolants, cutting oils, quenching oils, paint spray booth water, and all liquids.

Unlimited Capacities.

FULL FLOW
SELF CLEANING,
CONTINUOUS,
FULLY AUTOMATIC

DELPARK CHIP AND SLUDGE REMOVER

No chain conveyor to foul with chips and curls. Simplified design assures trouble-free operation.

DELPARK JUNIOR

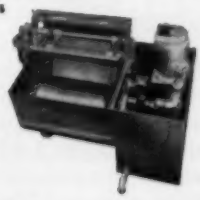
For small flow filtration of grinding fluids and cutting oils.

CONTINUOUS,
FULL FLOW,
EFFICIENT,
ECONOMICAL

Capacities ¼-1½ g.p.m.

DELPARK ROTO-GRAVITY FILTER

For continuous removal of fi... particles from liquids



FULL FLOW,
SELF CLEANING,
CONTINUOUS,
FULLY AUTOMATIC

Capacities to 150 g.p.m.

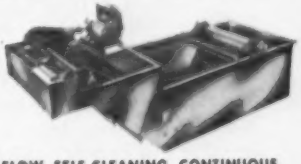
Delpark

INDUSTRIAL FILTRATION

Backed by more than 40 years experience in Industrial Filtration

DELPARK SCREEN-TYPE FILTER

For filtration of liquids of varying degrees of viscosity containing solids of different particles, sizes and widely differing weights.



FULL FLOW, SELF CLEANING, CONTINUOUS, FULLY AUTOMATIC

Unlimited Capacities.

DELPARK-DINGS MAGNETIC SEPARATOR

For removal of metal particles which respond to magnetic field.

For pre-filtration or independently.

FULL FLOW,
SELF CLEANING,
CONTINUOUS,
FULLY AUTOMATIC

Capacities to 100 g.p.m.

More complete literature is available on all of these Delpark Filters.

Write today specifying units on which you desire more information.

DELPARK-OLSON SUPERFLOW FILTER

The original tubular pre-coat filter using diatomaceous earth. Does not affect additives.

FULL FLOW,
SELF CLEANING,
CONTINUOUS,
FULLY AUTOMATIC

Capacities to 175 g.p.m.

U. S. PAT. NO. 2,693,282

INDUSTRIAL FILTRATION COMPANY, 91 INDUSTRIAL AVENUE, LEBANON, INDIANA

AUTOMOTIVE ASSEMBLY LINE

Inside on Ford, Union Strategy

Battle to gain public support has been bitterly fought . . . Ford won first round by waiting until last moment to make stock proposal . . . But Walter Reuther made deft counterattack—By *T. L. Carry.*

◆ PSYCHOLOGICAL warfare in the critical stages of the UAW-Ford labor negotiations took on importance to both sides that was out of proportion with effect on final settlement.

The side issue of gaining public support was almost as bitterly fought as some of the key issues in the contract, as Walter Reuther sought to strengthen his position as labor's slickest negotiator and Ford sought to gain stature as a leader in enlightened industrial relations.

Ford gained first advantage on the union when it waited until practically the last minute to present a counter proposal to the UAW's demand for a guaranteed annual wage. Apparently the company hoped that, by waiting, the union would not have time to argue and pick the package to pieces.

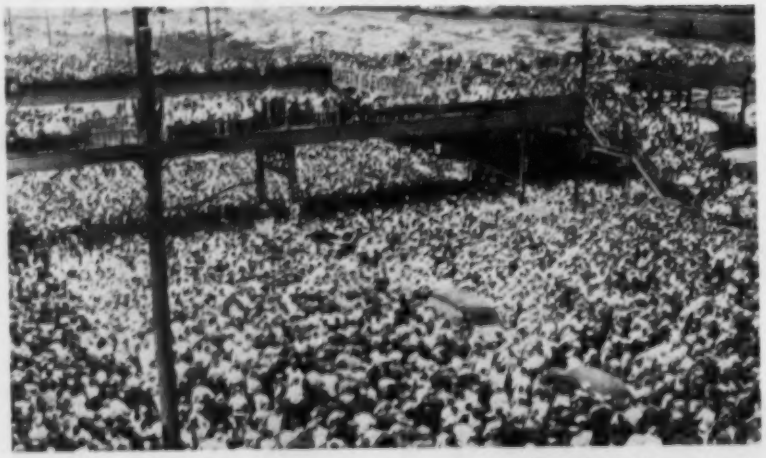
The offer, with its stock option clause, put Mr. Reuther in a bad light when he rejected it so quickly. To accusations that he did not give the offer enough study before turning it down, the always resourceful Mr. Reuther replied that it was a watered down version of an offer General Motors had made to the union several days before. Nevertheless, consensus was the union lost the first round to the company.

Start Round Two . . . When Mr. Reuther asked young Henry Ford II or John Bugas to attend an administrative session at the UAW Solidarity House, he deftly set the stage for the second round.

In declining the invitation, Mr. Ford called Mr. Reuther's attention to the fact that it would be an unforgivable error if Ford workers were not given the opportunity to pass judgment on the company offer. Mr. Ford also said that he hoped any decision reached would reflect the opinion of the workers.

Mr. Reuther promptly agreed and suggested that the workers should vote, but that they should have the opportunity to voice their opinion on the union's demand for GAW or the company's counter proposal. Meanwhile, the union had cut its demand for a 100 pct guaranteed wage to 80 pct of average weekly earnings.

Many Detroit labor observers believe that the union won round two because Mr. Reuther knew that his members were so conditioned to GAW thinking that the company would either have to reject the vote proposal or lose the election. In any case, Ford would lose face.



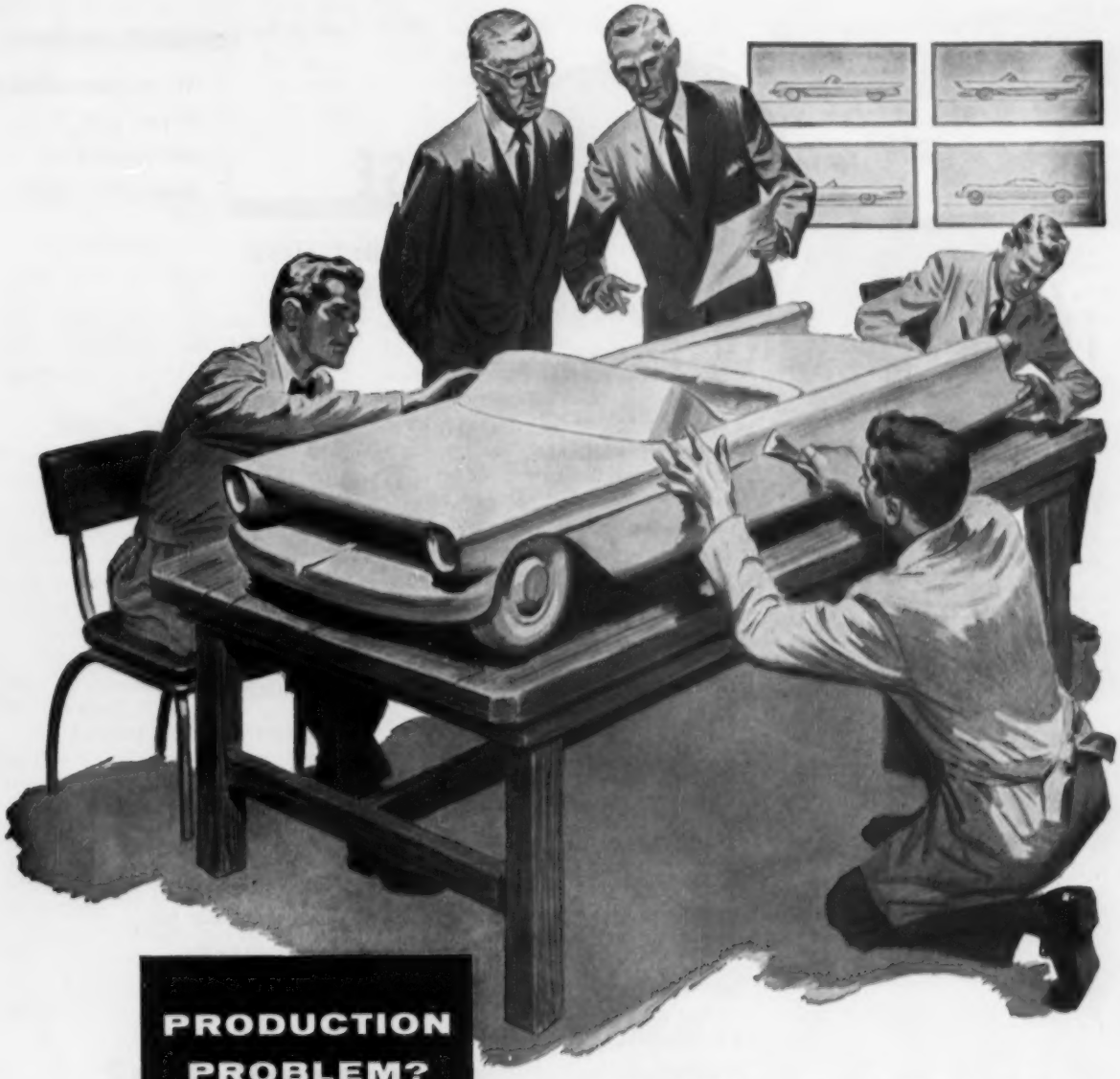
LOCAL 600 at Ford's giant Rouge plant massed at the gate to hear report on contract negotiations. At this point, company and union were far apart in negotiations on the guaranteed annual wage.

Automatic Transmissions . . . The trend toward automatic transmissions in cars has increased greatly during the past few years and at sometime in the future they will undoubtedly be standard equipment on all makes.

With this in mind, the Ford Motor Co. is planning a 580,000 sq ft addition to its Livonia, Mich., automatic transmission plant to meet the increased public demand and to keep pace with the overall company expansion.

M. L. Katke, general manager of the Automatic Transmission Div., said the new addition is the first project in the company's new $625 million facilities expansion program.

Construction of the addition has already started and production work in the new area is expected to start in June next year. More than 8500 people, exclusive of divi-



PRODUCTION PROBLEM?

if you use flat-rolled steel talk to a specialist

PROBLEM With present designs and manufacturing facilities, the auto industry needs wide coils of sheet steel with a minimum number of welds. These welds must be cut out before steel goes into the big presses—a costly, time-consuming process.

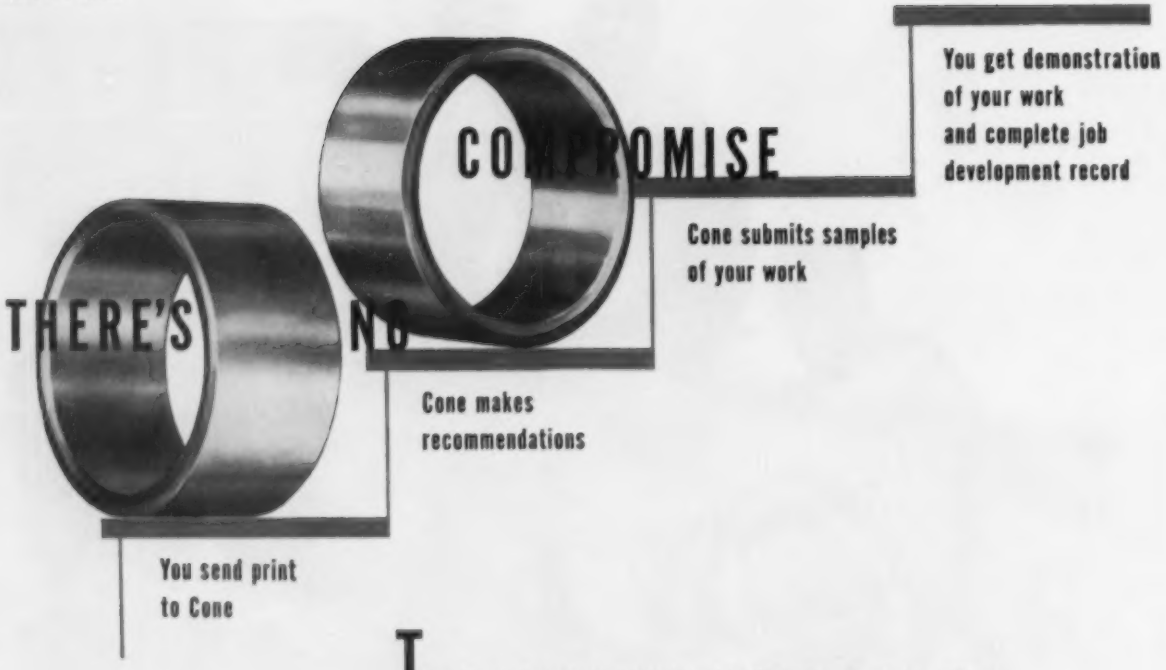
SOLUTION As a prime supplier to the automotive and other industries, Great Lakes Steel has developed facilities which now produce wide coils of steel in greater lengths . . . drastically reducing the number of expensive welds in each coil. Result: important fabrication savings for our customers.

MORAL Whether you make autos, appliances, or farm machinery . . . if it's flat-rolled steel, you can't lose by talking to Great Lakes Steel—specialists in flat-rolled production and application for 25 years.

GREAT LAKES STEEL CORPORATION
Ecorse, Detroit 29, Mich. • A Unit of
NATIONAL STEEL CORPORATION

SALES OFFICES IN BOSTON, CHICAGO, CINCINNATI, CLEVELAND, HOUSTON, INDIANAPOLIS, LANSING, LOS ANGELES, NEW YORK, PHILADELPHIA, PITTSBURGH, ROCHESTER, ST. LOUIS, SAN FRANCISCO AND TORONTO

No. 6 in a series


THERE'S NO COMPROMISE
You send print to Cone
Cone makes recommendations
Cone submits samples of your work
You get demonstration of your work and complete job development record

There is no adequate compromise with efficient production practices, if you are in business for a profit.

But you don't always know just how competitively efficient your equipment is. Case histories of what the other fellow is doing are sometimes garbled. At least the poor ones are not advertised. And conditions vary in all plants. Sometimes you have reason to be more concerned with what you don't want in new equipment than with what you do want. Cone believes too much is at stake for a machine to go into a line unequipped for the job, with either carbide or hss tools.

The Conomatic Carbide Development treats each job individually from standpoint of work, machine, tools, and operating personnel.

DATA FOR COMPARISON

Part	Bushing	Length	⅝"
Machine	1⅝" Conomatic	Hole Dia.	1¼"
Tools	100% Carbide Tipped	RPM	825
Material	8620	Time	14.8 Secs.
Stock Size	1⅝"		

Conomatic

For particulars send for "Four Steps With Cone"

CONE AUTOMATIC MACHINE COMPANY, INC., WINDSOR, VT., U.S.A.

Automotive Production

(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS
June 4, 1955	143,875*	27,555*
May 28, 1955	174,517	32,039
June 5, 1954	102,077	17,611
May 29, 1954	125,422	23,311

*Estimated Source: *Ward's Reports*

sional personnel, will ultimately be employed at the Livonia plant. Approximately 5000 workers are presently employed at the Livonia operation.

More Metropolitans

American Motors Corp. has doubled its original production schedule for its Metropolitan automobile, according to George Romney, president. Orders for an additional 20,000 units have been placed in England.

The 85-in. wheel base car is manufactured for American Motors by Austin Motor Co., Ltd., Birmingham, England.

Mr. Romney said that the Metropolitan, available in either hardtop or convertible models, is one of the largest selling foreign-built cars in America. "It accounted for 18.5 pct of all foreign car registrations in the United States in 1954," he added.

Formerly known as the NXI, the the Metropolitan is powered by an Austin A-40 engine and develops 42 hp.

Sales Race:

Ford still leads Chevrolet . . . Others gain.

Since its big push last December, Chevrolet has not been able to outsell Ford in the race to dominate the low price car field. First quarter sales figures compiled by R. L. Polk & Co. show that Ford sold 20,927 more cars than Chevrolet. Unofficial figures show that up to the end of April Ford is still leading its nearest competitor in sales in 35 states by approximately 21,000.

Whatever the final outcome of the race, first quarter figures show that both Ford and Chevrolet are getting a smaller share of the market this year than they did in 1954. Both are selling more cars but sales of other lines have also picked up and cut into the low price field.

Buick, Olds Gain

Chrysler Corp. showed a big gain. Sales of Chrysler cars for the first quarter were 40,671 compared to 27,683 for the same period last year. DeSoto Div. sold 29,080 units compared to 20,049 in 1954. Dodge sales increased by 31,379 compared to 1954, and Plymouth registered a sales gain of 58,009 cars over the first quarter last year.

Oldsmobile and Buick were the hottest cars in General Motors' line. Buick increased its share of the market by 2.23 pct and Oldsmobile set the pace with a percentage increase of 2.63.

Chrysler Moves Up

Chrysler Corp. showed gains in all its divisions as did GM with the exception of Chevrolet which had a percentage decrease of 4 pct. Ford's decrease, including all divisions, was 4.44 pct. The Independent's share also decreased but numerically they sold more cars. Together, the Big Three accounted for 95.33 pct of the new car market for the first quarter.

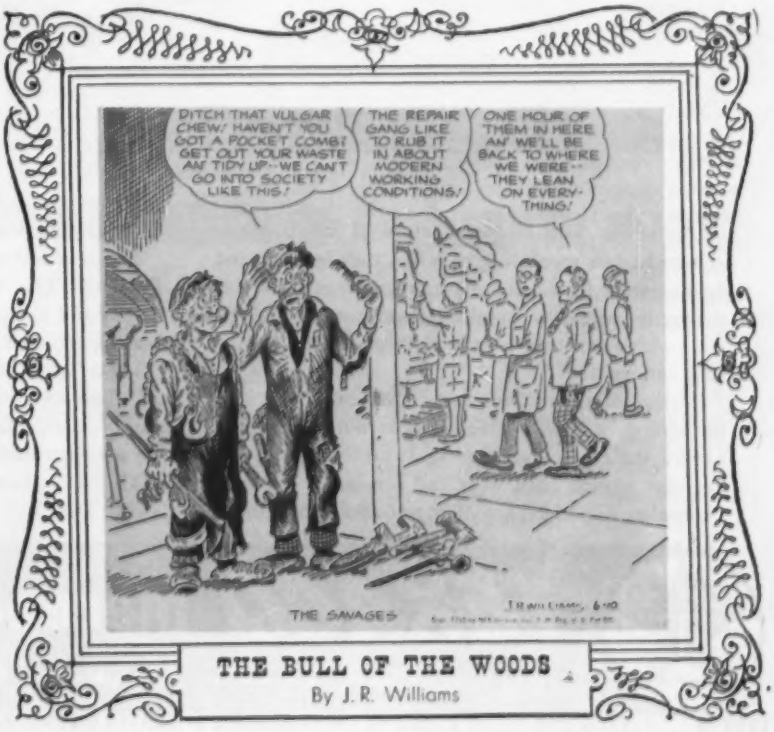
Highways:

Automakers stress need for road building program.

The auto industry's views on interstate highway expansion and improvement were presented to Congress recently by James J. Nance, president of AMA.

Mr. Nance, who is also president of the Studebaker-Packard Corp., told members of the House Public Works Committee that modernization of the country's interstate system over the next 10 years is vital to America's future. Traffic demands on the nation's 40,000-mile system will be nearly trebled in that time, he said, and urged Congress to authorize an emergency federal program to take care of the needs that have accumulated in the last 25 years.

A long term program was suggested for paying a large part of the cost of the improvement program. Most of it could be spread over 30 years and paid for out of future federal tax revenues.


DITCH THAT VULGAR CHEW! HAVEN'T YOU GOT A POCKET COMB? GET OUT YOUR WASTE AN' TIDY UP!--WE CAN'T GO INTO SOCIETY LIKE THIS!
THE REPAIR GANG LIKE TO RUB IT IN ABOUT MODERN WORKING CONDITIONS!
ONE HOUR OF THEM IN HERE AN' WE'LL BE BACK TO WHERE WE WERE-- THEY LEAN ON EVERY-THING!
THE SAVAGES
J.R. Williams, 6-10

THE BULL OF THE WOODS

By J. R. Williams

EXTRA PROTECTION FOR EVERY TOOTH

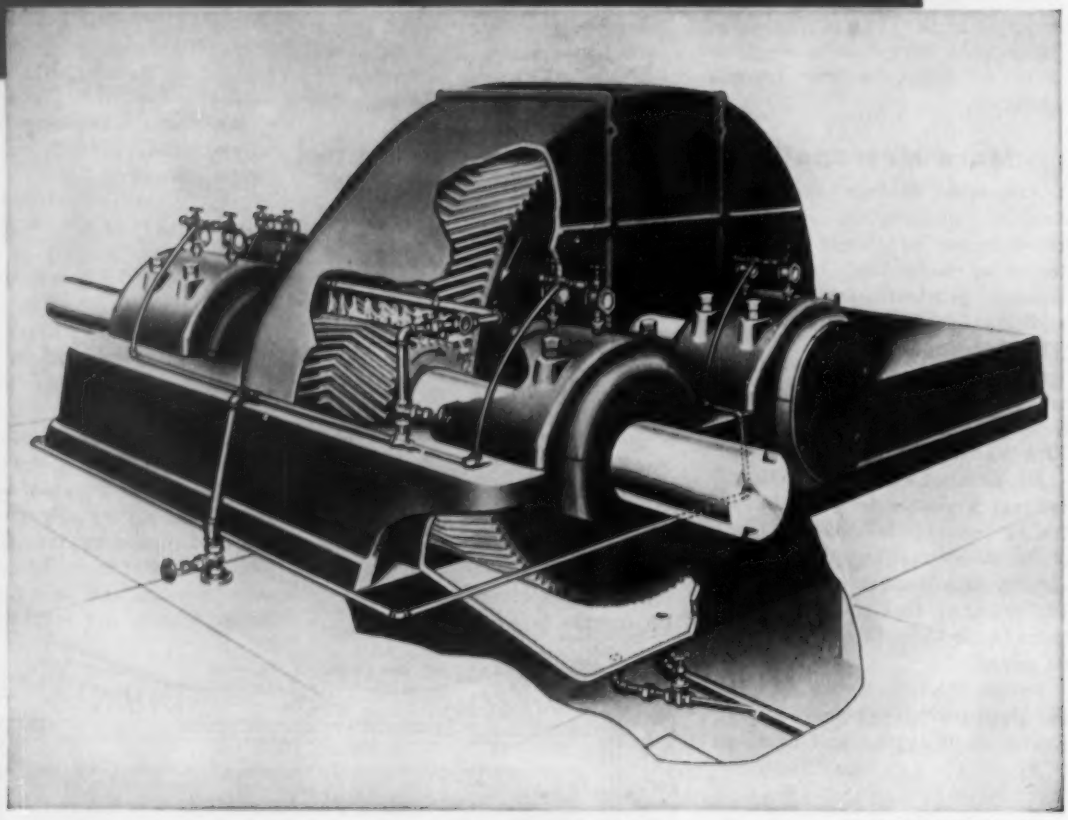


ILLUSTRATION COURTESY BOWSER, INC.

YOUR GEAR teeth will mesh more smoothly, last much longer, when they're protected against wear by *Texaco Meropa Lubricant*. The EP properties of this outstanding lubricant are high to start with—and they *stay* high throughout an extra long service life.

Texaco Meropa Lubricant resists oxidation and thickening, it does not foam, does not separate in service, storage or centrifuging. It protects gears and bearings against both wear and corrosion. There is a complete line of *Texaco Meropa Lubricants* to meet every requirement.

For your roll stand circulating systems, use *Texaco Regal Oil*. This heavy duty oil effectively resists oxidation and sludging, keeps systems clean, roll neck bearings protected.

Let a Texaco Lubrication Engineer help you step up efficiency and step down costs throughout your mill. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO

TEXACO Meropa Lubricants

FOR STEEL MILL GEAR DRIVES

TUNE IN . . . TEXACO STAR THEATER starring JIMMY DURANTE or DONALD O'CONNOR on television . . . Saturday nights, NBC.

Military Aid Demands More Billions

Administration asks $1.7 billion for allies' armies . . . Official calls figure low, hints at permanent $2 billion drain . . . Aid called cheaper than war but cost worries Congress—By G. H. Baker.

◆ COST of building and maintaining anti-Communist armies around the world is going up. And, since the United States traditionally pays the bills for much of its allies' armament, this means that a noticeable jolt in our total defense budget is in the making.

Take it from H. Struve Hensel, the outgoing Assistant Secretary of Defense for International Security, the $1.7 billion the Eisenhower Administration wants from Congress this year should be viewed as a "very low" figure. He hints that Congress had better get used to the idea of "permanent" foreign military aid of $2 billion-plus annually—and on a continuing basis.

Sent Them Billions . . . The U. S. has provided its allies with more than $10 billion worth of military equipment in the past 5½ years. Now, says Mr. Hensel, we must not only service and maintain this equipment, but also must keep sending new-style planes, trucks, and electronic devices each year to replace "obsolete" gear. It is not reasonable for us to expect our allies to keep their equipment either modern or in repair, he warns.

To senators and congressmen who wince at the staggering cost of maintaining armies around the globe, Mr. Hensel points out that foreign aid is a lot cheaper than war. (The Korean war cost the U. S. $18 billion, exclusive of pay for the troops.) But a growing number of congressmen of both political parties are asking a much bigger question: How long can we keep it up?

Navy Buying Steadies . . . Procurement of aircraft at the Navy Dept. is back on the track again after a hectic period of on-again-off-again ordering.

Navy's plane procurement headaches grew out of its former policy of ordering large quantities of aircraft that had not been completely tested.

To get new models of jet planes on the carrier decks and on the runways in a hurry, the Navy was placing orders first and testing the planes second. As a result, Navy headquarters in Washington was clobbering its plane manufacturers with a volley of confusing orders. It finally cancelled about $400 million in aircraft contracts, pending complete tests on plane performance.

Navy has now put into effect a new production plan called FIRM ("Fleet Introduction of Replacement Models") which calls for a slow rate of production of new models until all operating kinks have been ironed out. The admirals now wait until all pilots have commented on plane performance before giving the go-ahead to the production lines.

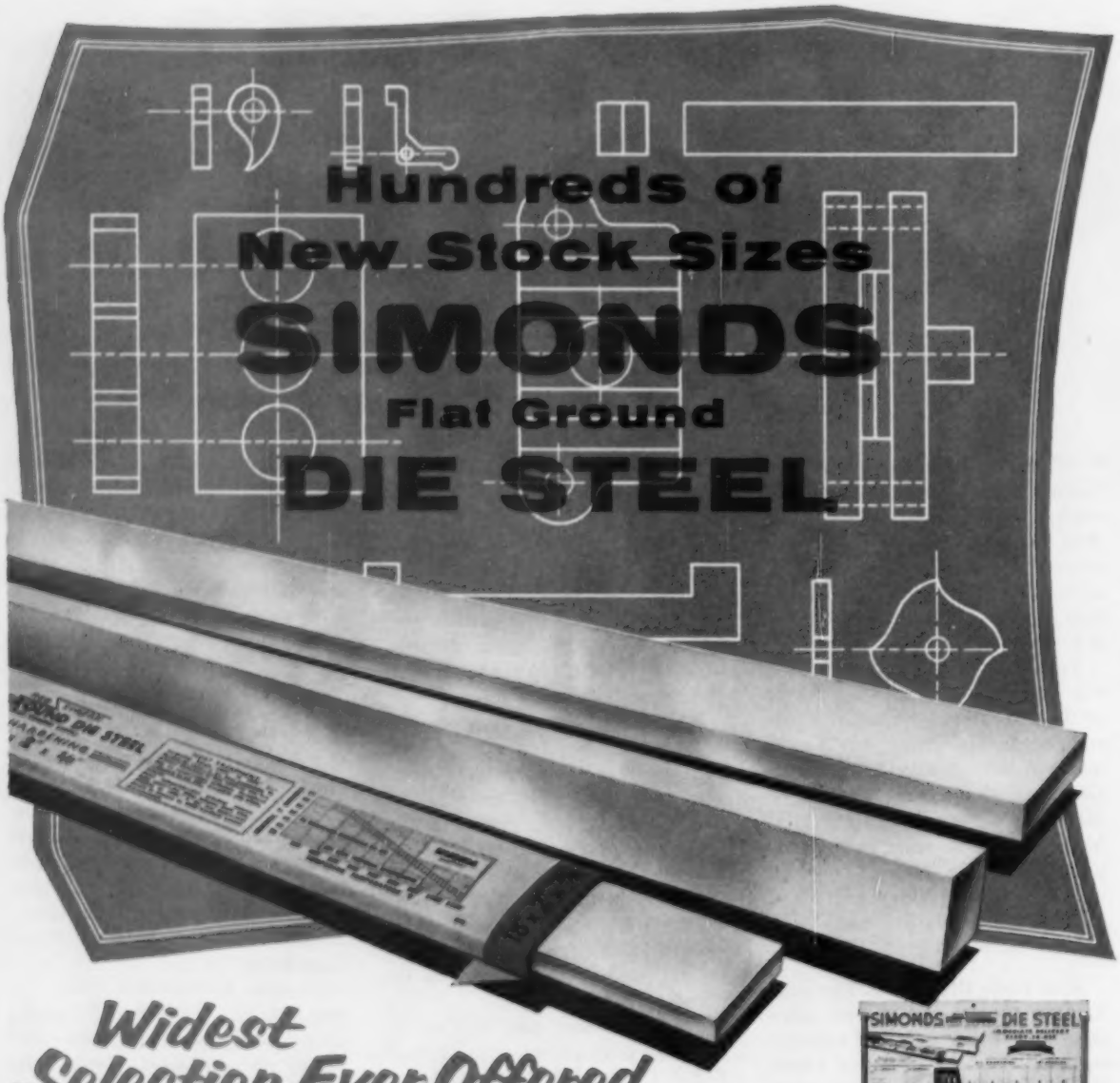
"They must have seen us coming and are hiding—their breath is still on the window pane."

Cut Consulting Funds . . . The Eisenhower Administration may be forced to do less consulting with business and industry in the fiscal year starting July 1. White House plans for widening the government's circle of advisors among companies, unions, and trade associations have been slapped down by an economy-minded House Appropriations Committee.

Despite assurances from Defense Mobilizer Flemming that the government is both wiser and richer when it uses advice from outside consultants and specialists, the White House-approved proposal to spend $176,160 for hire of outside experts has been trimmed down by an undisclosed but evidently substantial amount.

Many Get Nothing . . . Consultants to the Office of Defense Mobilization normally receive $50 plus $15 per diem. But many consultants come in on a WOC (without compensation) basis and receive only the $15 a day.

Example of the kind of industry-government work that may be affected: ODM wonders how far it should go in the stockpiling components of defense products. It's had long talks with Harold Vance, Studebaker-Packard chairman, John L. McCaffrey, president of



Widest Selection Ever Offered

Now you can get hundreds of new stock sizes of Simonds high-grade, precision-ground tool and die steel. Sizes that formerly were special are now available from stock at regular prices. Sizes you asked for to help you save time and money. "1001 sizes for 1001 uses" in either OIL or AIR Hardening type steel.

OIL HARDENING TYPE — Non-deforming, spheroidize-annealed for best machinability and consistently uniform hardenability — from Simonds' own steel mill. Extra-smooth finish with all decarburization and surface defects removed. Wide hardening range. Individually packaged (18" and 36" lengths) with simplified heat treating instructions.

AIR HARDENING TYPE — Non-deforming, spheroidize-annealed, 5% chrome — more wear-resistant yet easy to machine and heat treat with uniformly excellent results — another product of Simonds' steel mill. Extra-smooth finish with all decarburization and surface defects removed. Wide hardening range. 36" lengths. Individually packaged with heat treating instructions.

FREE WALL CHART

Ask your Simonds Distributor for a copy of this New Chart (18" x 31") giving full range of Stock Sizes now available.

For Fast Service from Complete Stocks

Call your SIMONDS Industrial Supply DISTRIBUTOR

SIMONDS SAW AND STEEL CO.
FITCHBURG, MASS.

Factory Branches in Boston, Chicago, San Francisco and Portland, Oregon
Canadian Factory in Montreal, Que. Simonds Divisions: Simonds Steel Mill, Lockport, N. Y.; Simonds Abrasive Co., Phila., Pa., and Arvida, Que., Canada

International Harvester, Army, Navy, and Air Force brass, and other industry and military spokesmen.

Union Buys Lots . . . The United Steelworkers of America (CIO) has added about 13,600 sq ft of downtown Washington, D. C., real estate to previous holdings. But David J. McDonald, union president, says the steelworkers have no immediate plans to build on the site.

Purchase of four lots at 17th St. and New York Ave. now gives the steelworkers a solid block of real estate from New York Ave. north to 17th and F St., N.W.

Construction of Washington office buildings by unions has been moving ahead at a rapid pace in the past 2 years. Union-owned buildings recently opened or under construction include the new American Federation of Labor Bldg., the International Brotherhood of Teamsters (AFL) Bldg., and the International Association of Machinists (AFL).

The steelworker's head office is to remain at 1500 Commonwealth Bldg., Pittsburgh, and it will continue to rent Washington office space at 1001 Connecticut Ave., the union says.

Blooper Brings Watch

Congress intends to keep closer watch on the way the government runs its metals-buying program. This sharper scanning is a direct result of an Office of Defense Mobilization blooper that cost the Treasury an estimated $400,000.

Defense Mobilizer Arthur Flemming concedes that ODM mistakenly made it possible for three copper-producing companies to reap windfalls totaling this amount.

Situation was brought to light by Sen. John J. Williams, R., Del., who claims the profits rolled in after the ODM cancelled contracts and a strong copper market sent prices up several cents per lb above the contract price. Each of the three companies named by Williams (Miami Copper, Copper Range, and Howe Sound Co.) then sold its copper in the open market at a higher price.

The General Accounting Office first put the finger on the ODM "slip," and recommends that the three companies return the windfall profit to the government.

Dr. Flemming says it won't happen again.

Probe:

Steel, auto men to testify at merger hearing.

Top executives from two steel companies and six automobile firms will probably touch off some fireworks when they testify before a Senate antitrust and monopoly subcommittee this week.

Representatives of Bethlehem Steel Co. and Youngstown Sheet and Tube, as well as Chrysler, General Motors, Ford, Studebaker-Packard, American Motors and Kaiser will take the stand to discuss mergers, competition, and general economic conditions.

C. H. H. Weikle, Commerce Research Manager of Bethlehem, is scheduled as a witness before the subcommittee, headed by Sen. Harley M. Kilgore, D., W. Va., on June 14. A spokesman for Youngstown will also probably appear next week.

Wants Merger Blocked

Purpose of the "extensive" hearings into mergers and the antitrust field, according to Sen. Kilgore, is to determine the effect of present antitrust laws on competition and to consider the "problem" of mergers. The subcommittee particularly intends to determine what influenced the government to approve recent mergers in the auto industry and disapprove a proposed combination between Bethlehem and Youngstown.

Meanwhile Rep. Emanuel Celler, D., N. Y., is urging the Justice Dept. not to alter its opposition to a proposed merger between Bethlehem Steel Co. and Youngstown Sheet and Tube.

Questions Move

Rep. Celler, chairman of the House Judiciary Committee, claims the firms' proposal to boost combined capacity by 12 pct—adding 2,000,000 tons in the Chicago district and 1,000,000 tons in the Youngstown area—is an effort to "get around" the government's opposition to the combination.

Study Atomic Planes

Facilities where the first atomic-powered airplane may be built will be constructed by the government's leading aviation research agency with funds newly granted by Congress and approved by the White House.

Using $4.8 million authorized as part of a fiscal 1956 construction authorization of $13.3 million, the National Advisory Committee for Aeronautics will put up a special atomic laboratory in Cleveland. Bulk of the $4.8 million, says NACA, will be used for the propulsion unit itself.

Check Reduction

Special job of the new facility, to be located at the NACA Lewis Flight Propulsion Laboratory, will be to solve the major problem of the effects of radiation on materials and equipment to be used in an atomic plane.

Another NACA project is the building of a $635,000 facility where conditions affecting intercontinental missile flights will be investigated.

ULBRICH
Stainless Steels
Certified
ANALYSIS can be given on any Ulbrich material.
COMPLETELY EQUIPPED CONVERTING WAREHOUSE
STRIP • Flat Wire and other Stainless Steels
Converted to your closest requirements and
exactly as you want it!
Inquiries for small lots welcomed.
INVENTORY
THIN GAUGE
TUBE POLISHING
ROLLING
FLATTENING & SHEARING
EDGE ROLLING
SLITTING
ULBRICH Stainless Steels
WALLINGFORD, CONN.
Phone: Wallingford 9-7771

WEST COAST REPORT

Kaiser Plans More Aluminum Capacity

Shipments of all products are at peak . . . Sales up $34 million this year . . . More power needed after 1960 by aluminum makers . . . All West steel producers stay over 100 pct capacity—By *R. R. Kay*

◆ WATCH for more aluminum reduction capacity. Kaiser Aluminum & Chemical Corp., Oakland, Calif., is busy planning it. This is good news for aluminum-hungry users.

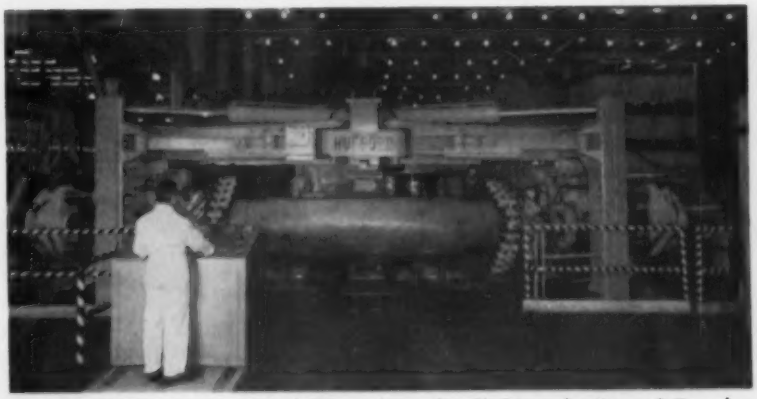
Shipments of all products are at peak levels, according to vice president and general manager D. A. Rhoades. The company looks for some $260 million in sales this year —up $34 million from 1954.

Assuming the government continues stockpiling at the present rate, Mr. Rhoades estimates shipments this year to non-integrated users will be 210 million pounds of primary pig, ingot, and billet—73.5 million pounds more than last year. Billet sales to extruders should hit 98 million pounds this year vs. 64 million pounds in 1954; and primary pig sales for 1955 will be 27 million pounds.

Power is a big factor in primary aluminum's future development. Kaiser officials feel there aren't enough hydro-electric projects under way throughout the country today. The Pacific Northwest, now producing about 35 pct of the nation's primary aluminum, is facing an acute power shortage after 1960.

What to do about it? Coal might be the answer. Company engineers are hard at work on coal as a possible source of low-cost energy for future expansions. Findings so far look good.

Steel Production High . . . Western steelmaking's "big four" are at the summit. Bethlehem Pacific, Colorado Fuel & Iron, Columbia-Geneva, and Kaiser Steel are going at top speed. They've all been operating for the past seven weeks at over 100 pct of rated capacity. L. S. Dahl, vice-president-engineering, Columbia-Geneva Steel, sees no reason why his company "shouldn't be able to hold at least the present operating rate for the balance of this year."



TITANIUM sheets are stretch formed at the El Segundo Div. of Douglas Aircraft. The 48 x 177 in. sheets cost about $2000 each.

Dispersal . . . Boeing Airplane Co., Seattle, is looking at several sites outside of its Pacific Northwest home base to build its Bomarc, long-range supersonic missile, for U. S. Air Force. The Midwest looks like the best bet. The Air Force means business. They've told Boeing to set up its Bomarc production outside of Seattle or lose their contract.

Scrap Exports Up . . . Pacific Coast harbors—all the way from Seattle to San Diego—are bustling with Orient-bound scrap export activity. Tonnage is piling up on the San Diego waterfront, with port officials predicting shipments this year of 20,000-50,000 tons. Two ships ar loading out of Oakland, Calif., one in Los Angeles; and a recent cargo sailed from small Port Hueneme, Calif. Western steel mills say they are getting enough scrap. But they're keeping a worried eye on exports.

Business Gains . . . The 11 Western States showed an 8.3 pct hike in general business activity first quarter 1955 vs. same period 1954. Greatest increases were in construction, with 25 pct more engineering contracts, and building permit valuations up 34 pct, according to a survey by West in Review.

West Briefs . . . Northwest Metal Products, Inc., is adding 70,000 sq ft to its Kent, Wash., plant. The $250,000 expansion should be ready by July. Firm makes hardware, air conditioners, furnaces . . . Hydra Shear, Inc., Oakland, Calif., is expanding its metal fabricating business . . . Whiteman Manufacturing Co., Los Angeles, is building at Pacoima.

How can you lose when it costs ONLY 68 CENTS PER HOUR

to put this new 50 hp Model CSM vertical milling machine to work in your plant with...

Kearney & Trecker

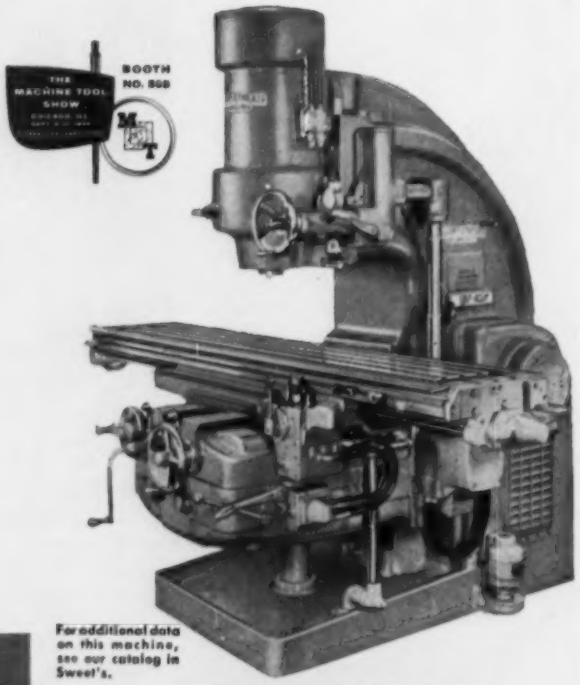
TOOL-LEASE PROGRAM

WHERE high horsepower is the key to faster, better production for you — Kearney & Trecker's 20-30-50 hp CSM machines are your answer. You can get CSM's in plain or vertical styles for as low as 68 cents per hour — *and even less.*

Under Tool-Lease Plan "A," one of three seven-year lease agreements offered by Kearney & Trecker, you make two semi-annual rental payments, totaling 25% of the machine's price during each of the first three years. Actually in dollars and cents you pay only 68 cents per hour for a new 50 hp, Model CSM milling machine. That means a machine installed in your plant and in operation — *literally for pennies an hour!*

What's more, under Tool-Lease, you can rent any of over 250 different types and sizes of standard milling machines or precision boring machines. All are available under three basic plans, with varying options to continue or terminate the lease, or to purchase the equipment. If you require special machinery or heavy-duty CSM bed types, special agreements will be considered.

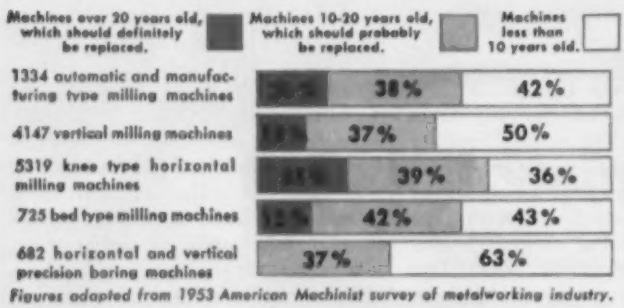
For complete information on Tool-Lease, see your Kearney & Trecker representative or mail coupon to Kearney & Trecker Corp., 6784 W. National Avenue, Milwaukee 14, Wisconsin.



For additional data on this machine, see our catalog in Sweet's.

MACHINE TOOL OBSOLESCENCE IS BECOMING CRITICAL! WHERE DO YOU STAND?

Electrical Equipment Industry — Includes machines for manufacture of wiring, instruments, motors, generators, transformers, switchboards, welders, transport equipment, lamps, radios, television, phonographs, transmitters, telephone-telegraph and other communication gear. Of the 12,207 machines in use today which can be replaced by Tool-Lease equipment — 18% are over 20 years old, 38% are 10 to 20 years old!



Figures adapted from 1953 American Machinist survey of metalworking industry.

KEARNEY & TRECKER CORP.
6784 W. National Ave., Milwaukee 14, Wis.

Please send me Bulletin TL-10A on Tool-Lease Program and booklet titled "Critical Picture of Creeping Obsolescence."

Name.....

Title.....

Company.....

Address.....

City..... Zone..... State.....

MACHINE TOOL HIGH SPOTS

How Much Have Machines Improved?

Test shows 10 years have brought important changes in milling machines . . . New unit twice as fast as 1945 model . . . Faster feed, less waste motion mark modern design—*By E. J. Egan, Jr.*

◆ PRODUCTIVITY of modern machine tools is a major selling point, but one of the most difficult for a machine tool salesman to get over to a prospect. It's a simple matter to compare a 1955 model with a 1905 relic. Common sense will rule that the modern version is far more productive than the vintage version.

But to compare the current machine with a similar tool just 10 years old isn't quite so easy. An offhand guess would likely be that the new one just had a few more gadgets here and there to make it work a bit faster and more accurately.

Could the new machine actually be twice as productive per manhour or per square foot of floor space as its 10-year old predecessor? In some cases it's true. Constant improvement during the past 10 years in some basic machine tool types have brought startling increases in productivity.

Test Milling Machines . . . Cincinnati Milling Machine Co. demonstrated this in an interesting manner at its recent 70th anniversary celebration. The firm pitted one of its 1955 plain milling machines against a 1945 plain miller in a productivity race. It wasn't much of a contest. The new machine won hands down.

Particular care was taken to insure duplicate working conditions. Both machine tools were of the same size, style and range. Both were powered by 5 hp motors and were in perfect running order. A supply of workpieces that required a simple straddle milling operation was distributed.

Machine operators, too, were equal in skill and training. And identical sets of side milling cutters and clamping fixtures were used on the two machines.

Speed Edge Counts . . . Up to this point, before the starting signal was given, conditions appeared to be much the same. But when the optimum speed and feed rates were chosen for each machine, certain important differences began to show up. For example, a vibration-damper overarm on the new model permitted use of a higher feed rate without chatter and vibration. This factor alone allowed the new tool to chop 42 pct off the machining time required by the 1945 unit.

Combining double fixturing and automatic table cycling to do reciprocal milling increased the new machine's advantage still more. While work was being unloaded and reloaded at one end of the table, a workpiece was being milled at the opposite table end. The new machine did conventional milling on one piece and climb milling on another. An automatic backlash eliminator prevented any possibility of the cutter pulling the table into the cut.

Automatic table cycle settings on the new machine also meant that rapid traverse, reversing and other controlled motions insured a minimum of non-cutting time.

"I've asked Casper to step in. He's good on production short cuts."

Doubles Old Output . . . In all, these and other advantages added up to a 100 pct productivity gain for the new machine on the part chosen for the demonstration. Per hour, the 1955 miller turned out twice as many workpieces as its 1945 counterpart.

For some shops, this extra productivity in modern equipment might mean one new machine could replace two older models. The most obvious savings would occur in labor, maintenance and floor space. Any machine tool salesman would be only too happy to detail these and other savings.

Still another way of looking at productivity advantages is to consider that one new machine might do twice the work of one older unit. Again this would bring obvious savings in the cost of direct labor per part produced.

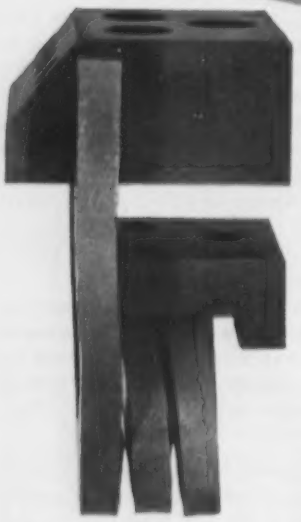
Of course, not all machine tool types are twice as productive as 10 year old models but a few have done even better.

I-T-E

SAVES MONEY BY USING

Revere Extruded Shapes

PROBABLY YOU CAN TOO!



Actuating mechanism, showing overload coil brazed to two Revere Extruded Shapes.

Overload device, OD-2, made by I-T-E Circuit Breaker Company, 19th & Hamilton Sts., Philadelphia, Pa., using Revere Copper Extruded Shapes.

Here is a photograph of the I-T-E Dual Selective Overcurrent Trip, an air circuit breaker part. It contains two Revere Extruded Shapes, in copper. In the detail view, the beveled shape at the top is furnished in Free-Cutting Copper, to speed up the drilling and tapping of the holes. The piece below it was originally milled from rectangular copper bar, 1 x 2 inches. The bar weighed 7¾ lbs per foot, and 1.8 lb of scrap per foot was generated in machining it to the angular form shown. The company then switched to a Revere Extruded Shape, weighing a little less than 6 lbs per foot. Though the shape inevitably costs more per pound than the bar, the reduction in weight was sufficient to save almost 44¢ per foot over the bar, and of course additional savings were realized in reduced machining time and in scrap handling. Production also was speeded up. This is an outstanding example of the economies offered by shapes.

Look into extruded shapes, in copper and copper-base alloys, and aluminum alloys. The nearest Revere Sales Office will be glad to explore the subject with you.

REVERE

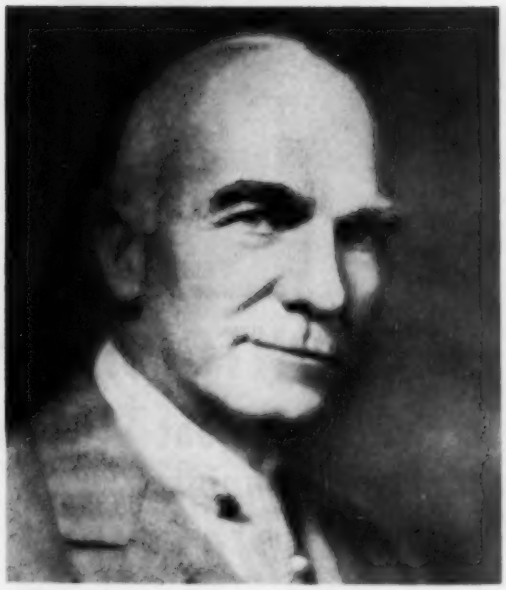
COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

230 Park Avenue, New York 17, N. Y.

• • •

Mills: Baltimore, Md.; Chicago and Clinton, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Rome, N.Y. Sales Offices in Principal Cities; Distributors Everywhere.



The Iron Age

SALUTES

Charles S. Mott His industrial leadership helped build an automaking empire and earned him a fortune. His civic leadership and generosity helped build a city and earned the thanks of its people.

Some time ago Charles Mott was approached for a contribution to a civic activity. The dean of General Motors directors listened non-committally to the request, then walked to the far end of his living room. He turned off an unneeded light, returned to the dismayed requester and offered double the sum asked.

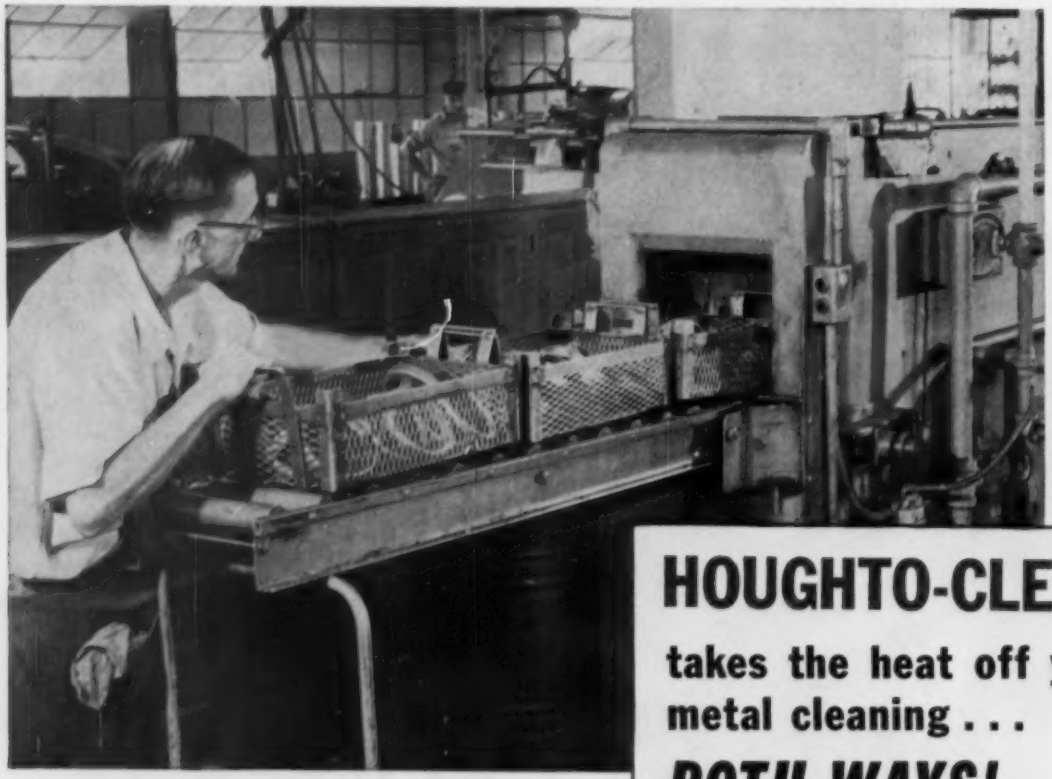
Mr. Mott is a frugal man and doesn't care who knows it. But he is deeply generous where the needs of others are concerned. And he is highly successful.

Born June 2, 1875, in Newark, N. J., Charles Mott started making car axles about 50 years ago and turned a small plant into a $3 million business. In 1913 he sold his interest to General Motors, taking stock in return, and began a long period of GM board and executive service. He was General Motors vice-president for 21 years; he headed Michigan operations for a long period.

Mr. Mott helped build the auto industry but his record of achievement goes beyond any company or industry. This month the city of Flint, Mich., paid special tribute to his civic leadership and contributions over the years. Three-time Flint mayor, he provided the city with a solid, businesslike government. He once mobilized over $3 million of his own resources to keep a teetering bank alive. He has held important defense posts. Through the Mott Foundation he provides healthful leisure activities for children and adults.

He is a lavish but not a careless philanthropist. He hates waste, avoids gestures and displays. At a Kiwanis meeting he declined to pay a guest's 10¢ fine for some ritual infraction. He also declined to mention he was giving the same guest $8000 for a youth program.

He is a moderate man but not cold or remote. When Flint was digging out of a hurricane 2 years ago, he charged into the repair work and, at 78, protested when he was restrained from climbing roofs. A man who balks at the extravagance of 3¢ stamps on Christmas cards, he gives unstintingly of himself and his wealth when the real needs of neighbors are at stake. He has won a city's real gratitude.



HOUGHTO-CLEAN
takes the heat off your metal cleaning . . .
BOTH WAYS!

HOUGHTON COLD CLEANERS

- ***keep cleaning room temperature lower***
- ***keep cleaning room morale higher***

Effective in either still tank or power washers, HOUGHTO-CLEAN room temperature metal cleaners provide these new economies for you—welcome benefits for workers:

- Eliminate costly heating equipment and high fuel costs.
- Solution life is long—and easy to mix.
- Higher worker morale—no warm weather dip in production.
- Parts are never too hot to handle.
- Hot, steamy installations are eliminated.

It will pay you to investigate the many advantages of HOUGHTO-CLEAN Cold Cleaners and how they can be applied to your operation. Call the Houghton Man, or write to E. F. Houghton & Co., 303 W. Lehigh Avenue, Philadelphia 33, Pa.

HOUGHTO-CLEAN COLD CLEANERS

...products of

E. F. HOUGHTON & CO.
PHILADELPHIA · CHICAGO · DETROIT · SAN FRANCISCO

Ready to give you on-the-job service . . .

The Iron Age INTRODUCES

James J. Munns, elected senior vice president, **National Steel Corp.,** Pittsburgh.

Elwin E. Smith, named manager-lubricant development, chemical development division of **Climax Molybdenum Co. George S. Cripps,** named manager—agricultural development, chemical development. **Herbert Kay,** named manager of new chemical development, and **Benjamin Danziger,** named manager of catalyst and pigment development.

Frederick C. Albanese, appointed office manager, Hamilton Steel Warehouse in Cleveland, **Jones & Laughlin Steel Corp. Clarence J. Pistor,** appointed manager of the Lancaster, Pa., warehouse.

E. W. Seay, appointed assistant manager, general advertising, **Westinghouse Electric Corp.**

Glen Hartman, appointed assistant manager — operations, Ohio Seamless Tube Div., **Copperweld Steel Co.,** Shelby, Ohio.

William H. Owen, named general traffic manager, **Great Lakes Steel Corp.,** Detroit.

Edward W. Sparkes, appointed manager—Syracuse Branch, **Crucible Steel Co.**

Arland R. Walkley, appointed general manager, Shaw-Box Div., **Manning, Maxwell & Moore, Inc.**

Charles W. Frederick, appointed director of engineering, and **Clyde W. Truxell, Jr.,** appointed works manager, Detroit Diesel Engine Div., **General Motors Corp.**

Donald J. McPherson, appointed assistant manager, metals research department, **Armour Research Foundation,** Chicago.

O. A. Olson, appointed assistant director—research, Lacledе-Christy Div., **H. K. Porter Co.**

John W. Reedy, appointed regional public relations manager—Detroit, **General Motors Corp.**

James H. Hinman, appointed assistant sales manager, aluminum products, Dallas Div., **Revere Copper and Brass Inc.**

J. French Robinson, elected chairman of the board, **Consolidated Natural Gas Company.**

Theophil H. Mueller, elected a director, **Torrington Co.,** Torrington, Conn.

Robert M. Meadows, appointed superintendent of planning, **Chrysler Corp.,** Nine Mile Press Plant.

C. Herbert Quick, appointed assistant director of research and development, **Norton Co.**

Mathias Klein, appointed chief manufacturing engineer, **Marquardt Aircraft Co.**

ROY H. GLOVER succeeds Cornelius F. Kelley as chairman of the board, Anaconda Copper Mining Company.

GEORGE F. GROFF, appointed vice president of finance, Crucible Steel Company.

EDWARD P. GILLANE, named president, general manager and a member of the board of directors, Potter & Johnston Co., Pawtucket, Rhode Island.

J. EDWARD McLEAN, elected vice president-research and engineering, Stubnitz Greene Spring Corp.

E. H. Kinelski, joined the development and research div., **International Nickel Co., Inc.,** New York.

D. J. Yates, appointed socket screw field representative, Los Angeles, **Bristol Company.**

B. M. Carter, promoted to new car sales manager, Dodge Div., **Chrysler Corp.**

F. J. Hoder, Jr., named general manager, Micro-Precision Div., **Micromatic Hone Corp.,** Evanston Illinois.

Adolph Burstein, appointed assistant chief engineer, Convair Div., **General Dynamics Corp.,** San Diego. **S. G. Frank Haas, Jr.,** has been named chief development engineer.

Mark R. Miller, appointed general manager, Defense Div., **Servel, Inc.,** Evansville, Indiana.

Jack L. Berkebile, appointed district sales manager, **Penn Machine Co.,** Johnstown, Pa.

L. J. Frey, appointed assistant sales manager, **Allegheny Steel Band Co.,** Pittsburgh.

John B. Millis, appointed special assistant to vice president and group director, **Mercury and Special Products Divisions,** Ford Motor Co.

Henry E. Kerley, appointed chief engineer, coal mines, Tennessee Coal & Iron Div., **U. S. Steel Corp.,** Birmingham, Alabama.

James W. Monroe, named personnel director, Laclede-Christy Co., a division of **H. K. Porter Co., Inc.**

ALEXANDER L. NAYLOR, elected president, Fairbanks Company, New York.

FRED J. KIRKMAN, appointed executive vice president, Burgess Battery Co., Freeport, Illinois.

CLAUDE B. KERSHNER, appointed director of purchases, Birdsboro Steel Foundry & Machine Co., Birdsboro, Pennsylvania.

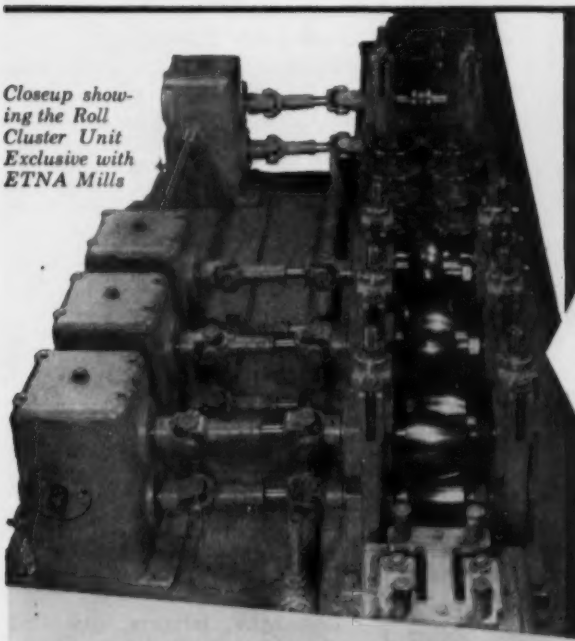
DONALD D. CLEGHORN, named general manager, Chicago Steel Tank Co., a division of U. S. Industries, Inc.

Washington Steel's production methods provide new economies in the purchase of stainless sheet. The controlled accuracy of gauge in the rolling process gives you more area per ton or the equivalent area with lesser weight. This close adherence to specified gauge also results in longer die life.

Washington Steel
CORPORATION
WASHINGTON, PENNSYLVANIA

Your steel warehouse distributor will gladly tell you the Micro-Rold Story.

LEADING THE INDUSTRY IN DESIGN...

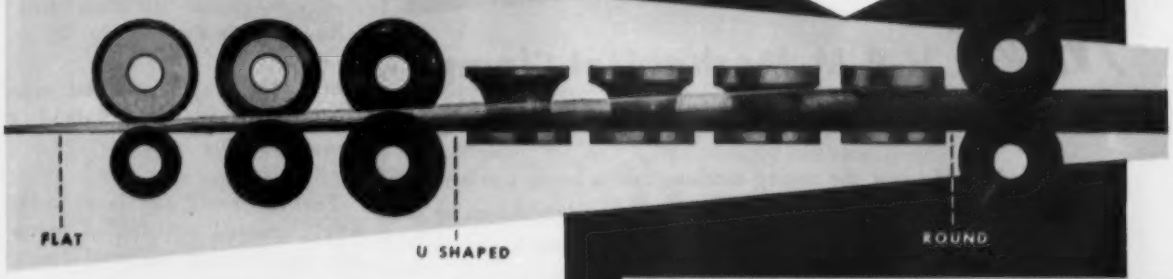


Closeup showing the Roll Cluster Unit Exclusive with ETNA Mills

NO MARKING . . . NO SCRATCHING
NO UPSET EDGES . . .

THE Etna METHOD

FOR SMOOTH, WELL FORMED STEEL TUBING



Exclusive with Etna is the cluster unit. This unit progressively rolls the tube into shape without excessive stretching of the edges, thereby eliminating the "buckling" experienced with ordinary tube mills. Etna machines are not forming mills, they are designed for one purpose only . . . to make clear, well formed carbon and stainless steel tubing with no marking, no scratching, no upset edges. Write for complete details.

The ETNA 4KU Mill

Abbey ETNA Company

3420 MAPLEWOOD AVE., TOLEDO 10, OHIO

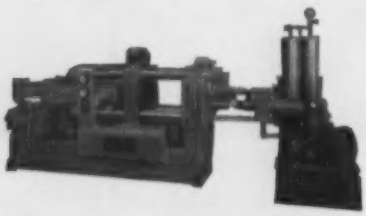
HOW TO GET SOUND DIE CASTINGS

NEW H-P-M Mechanical Clamp Assures Positive Die Locking

Here's why H-P-M's new die casting machine makes better castings: new positive clamping action is achieved by sliding wedges driven by knuckle-joint linkage which preloads the press frame and backs up the platen. The results . . . a minimum of flash . . . sound castings.

In this new H-P-M clamp mechanism there are no toggle pins under heavy shear load . . . no single line contacts . . . and no extremely high stressed members that normally result in high maintenance cost and down time.

These are just a few of the 40 new and improved features of the new H-P-M die casting machine. Write for Bulletin 5400, a completely illustrated story on this H-P-M line of profit makers.



THE HYDRAULIC PRESS MANUFACTURING COMPANY

1006 Marion Road, Mount Gilead, Ohio, U. S. A.

HPM

PERSONNEL

R. P. Wagner, appointed manager, distribution equipment group—sales div., **Westinghouse Transformer Division. J. W. Harrell,** named manager of the newly created regulator and network transformer section of power equipment sales for the division.

H. A. Wile, Jr., appointed manager, belting and packing sales, Quaker Pioneer Rubber Mills, division of **H. K. Porter Co., Inc.** San Francisco.

Richard W. Summey, elected vice president, **Bridgeport Brass Co.**

L. J. Barker, appointed chief specification engineer, **Kaiser Aluminum & Chemical Corp.,** Oakland, Calif.

Richard V. Johnson, appointed manager—export division, **Electric Auto-Lite Co.,** Toledo, O.

W. T. LaRue, appointed merchandising manager, **Cadillac Motor Car Div.**

Earl E. Orcutt, appointed to the newly created position of manager, engineering material operations, **Chrysler Corp.,** Detroit.

William M. Grimes, appointed manager — merchandising and product planning office, Mercury Div., **Ford Motor Co.**

OBITUARIES

William Jarmleh Kelly, 56, president of the **Machinery and Allied Products Institute** and chairman of the Council for Technological Advancement, national spokesman for the capital goods industries, and senior partner of William Kelly & Co. of Chicago.

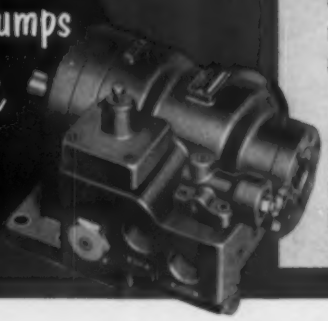
S. M. Swain, vice president in charge of research, **North American Refractories Co.,** Cleveland.

Charles McLeod Lewis, president, **Badger Malleable & Mfg. Co.,** South Milwaukee, Wis.

Do You Want To Save Horsepower and Heat?

VICKERS®

Two-Pressure Oil Hydraulic Pumps Require Less Power for Two-Pressure Circuits



Automatically Provide

High Volume @ Low Pressure for fast closing, rapid advance, and rapid return.

•

Low Volume @ High Pressure for feeding, compressing, clamping, and holding.

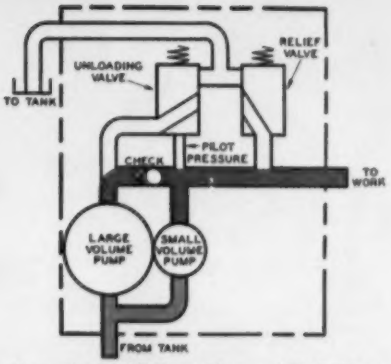


Fig. 1 Combined Delivery of Large and Small Volume Cartridges at Low Pressure

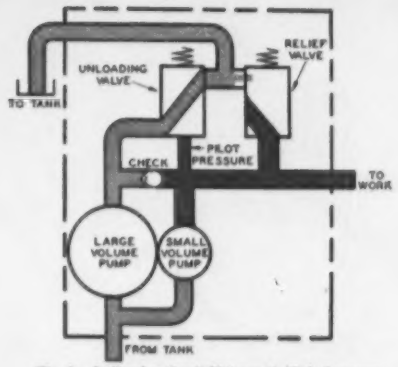


Fig. 2 Delivering Small Volume at High Pressure

Two Vickers Vane Type pumping cartridges are mounted on the same shaft—in the same housing, driven by the same prime mover. One provides a large volume of oil while the other delivers a small volume. These Vickers Two-Pressure Pumps have proved advantageous in a wide variety of applications.

For example, in closing a press or in rapid advance, both pump cartridges work together, supplying maximum volume for quick operation (see Fig. 1). When the press is closed and compression begins, or when the tool goes into feed immediately prior to beginning the cut, the large volume cartridge is automatically unloaded to the reservoir at zero pressure (see Fig. 2). The small volume cartridge alone then provides the lower volume required at high pressure.

These Vickers Two-Pressure Pumps are most economical in power consumption for such two-pressure operation. The reason for this is that a small-volume pump working at full capacity is MORE EFFICIENT than a large-volume pump working at partial capacity. Regardless of momentary delivery, the internal leakage of any pump is proportional to its size and operating pressure. The chart (Fig. 3) shows an interesting comparison between a Vickers Two-Pressure (Two-Volume) Pump and a variable volume vane type pump on a press circuit.

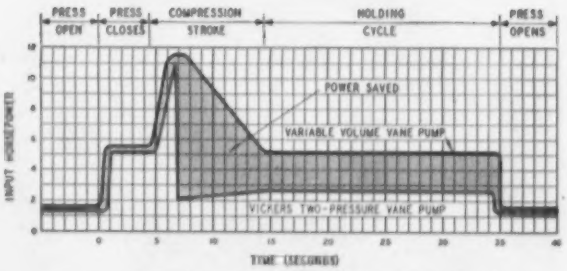


Fig. 3. On this typical press application the saving in power is approximately 50% with a resultant saving in heat in the system.

Like all Vickers Vane Pumps, these two-pressure pumps have the hydraulic balance feature that relieves bearings of all pressure loads (one of the major causes of wear). Cartridge construction enables customer to service in his own plant instead of returning to factory should repairs be necessary. Relief and unloading valves are integral . . . minimizing piping and connections. Complete range of sizes up to 48 gpm. For additional information, ask for Bulletin 54-70a.

6895

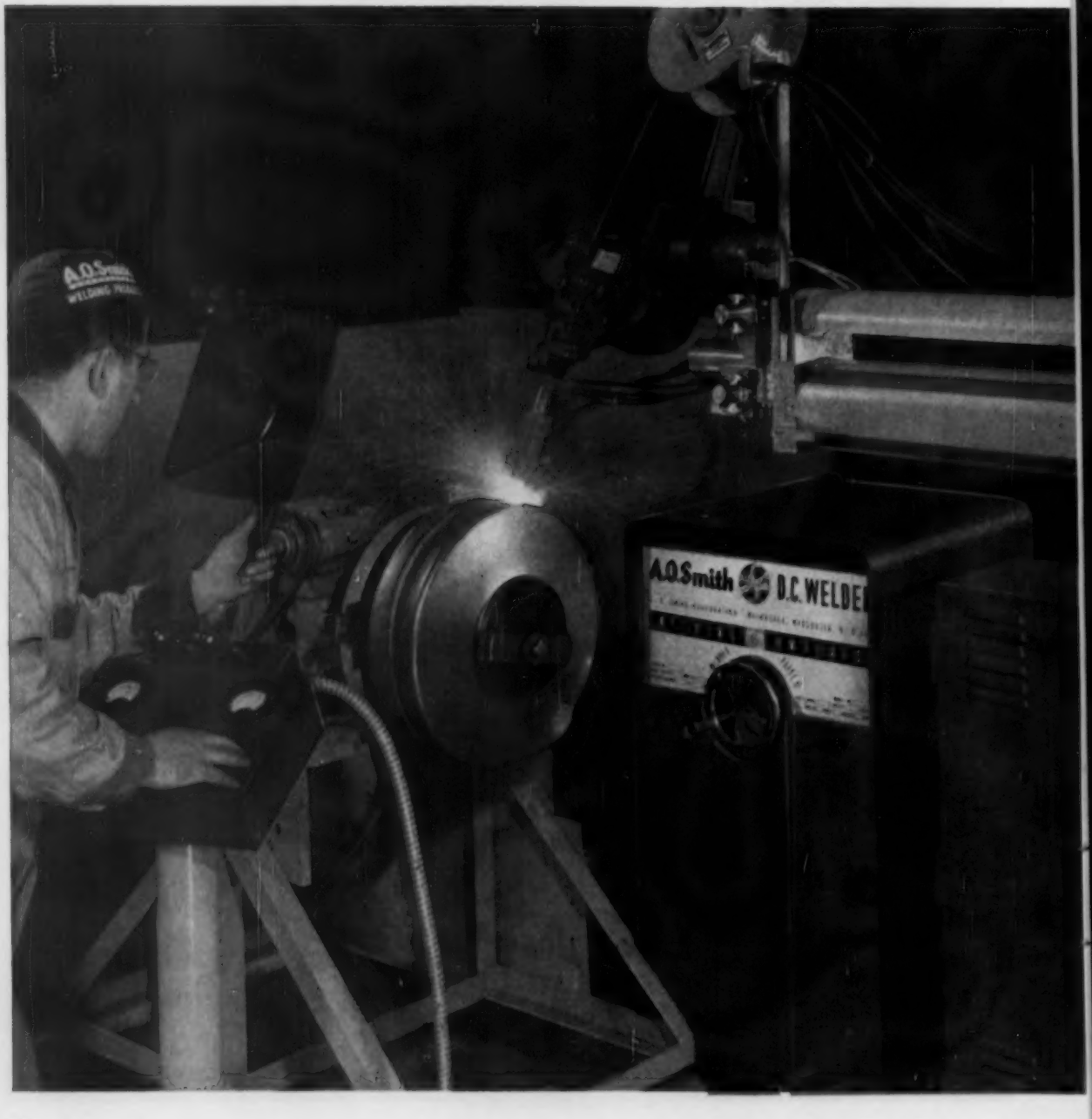
VICKERS Incorporated
DIVISION OF SPERRY CORPORATION
1420 OAKMAN BLVD. • DETROIT 32, MICH.

Application Engineering Offices • ATLANTA • CHICAGO AREA (Brookfield) • CINCINNATI • CLEVELAND • DETROIT HOUSTON • LOS ANGELES AREA (El Segundo) • MINNEAPOLIS NEW YORK AREA (Summit, N. J.) • PHILADELPHIA AREA (Media) PITTSBURGH AREA (Mt. Lebanon) • ROCHESTER • ROCKFORD SAN FRANCISCO AREA (Berkeley) • SEATTLE • ST. LOUIS • TULSA WASHINGTON • WORCESTER

ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921

C-O-MATIC

NOW! Weld even mild and



announced by A. O. Smith

medium carbon steels automatically . . .

new gas-shielded metal arc process uses Carbon Dioxide to shield the arc

ON GAS ALONE **in one year's time (3 shifts per day, 260 days), a single C-OMATIC unit saves you *$14,902.00 over Argon, $15,367.00 over Helium.***

● **NEW ECONOMY** thanks to use of less-costly Carbon Dioxide . . . thanks to low maintenance requirements of functional design.

● **X-RAY QUALITY WELDS** — Strength and ductility — yours with C-OMATIC.

● **VISIBLE ARC** means faster, easier welding . . . quick, convenient spotting of nozzle. (When required, C-OMATIC is easily convertible to submerged arc, too.)

● **DEEP PENETRATION** further assures high quality welds. No slag to remove . . . no flux to clean up.

● **ACCURATE CONTROL SYSTEM** of constant current design maintains preset arc voltage without fluctuation. No complex electronic circuits! Auxiliary controls available.

● **POWER SOURCE** — The service-proved A. O. Smith d-c rectifier.

Chart illustrates astonishing savings

	HELIUM	C-OMATIC	YOUR SAVINGS		ARGON	C-OMATIC	YOUR SAVINGS
Gas consumption per hour	70 cu. ft.	30 cu. ft.	40 cu. ft.	Gas consumption per hour	60 cu. ft.	30 cu. ft.	30 cu. ft.
Cost of gas per cu. ft.	$0.067	$0.01	$0.057	Cost of gas per cu. ft.	$0.09	$0.01	$0.08
Cost of gas per hour	$4.69	$0.30	$4.39	Cost of gas per hour	$5.40	$0.30	$5.10
Cost per hour 60% of duty cycle	$2.81	$0.18	$2.63	Cost per hour 50% of duty cycle	$2.70	$0.15	$2.55
Cost per day (3 shifts, 22.5 hours)	$63.20	$4.05	$59.15	Cost per day (3 shifts, 22.5 hours)	$60.80	$3.38	$57.42
Cost per year (260 days)	$16,420	$1,053	$15,367	Cost per year (260 days)	$15,780	$878	$14,902

GET ALL THE FACTS NOW! Write for free booklet describing C-OMATIC in detail. Welding Products Division, A. O. Smith Corporation, Milwaukee 1, Wisconsin.

See C-OMATIC in action at the AWS show in Kansas City, Mo. . . . June 8 to 10 . . . Booth 256.

Through research . . . a better way

A.O.Smith

CORPORATION

WELDING PRODUCTS DIVISION
Milwaukee 1, Wisconsin
INTERNATIONAL DIVISION: MILWAUKEE 1, WIS.

can YOUR production equipment KEEP UP WITH THIS MARKET?

★ By 1965, the experts predict there will be 80 million automobiles in existence, as compared to some 50 million now.

For that traffic load, more than 50 billion dollars will be needed to rebuild the 3,350,000 miles of existing roads and to build new super highways.

Each million dollars of highways requires between 420 and 450 tons of steel. Each automobile averages about 3,500 pounds of steel, plus many pounds of copper, brass, aluminum, rubber and plastic.

Will you lose out competitively on this big market on poor quality of product or slow production equipment? Good equipment brings down production costs and improves product quality.

Aetna-Standard designs and builds equipment for producing, processing and fabricating steel, copper, brass, aluminum, rubber and plastic. Here is one example—an 80" Sheet Side Trimming and Shearing Line at the Fairless Works, U. S. Steel Corporation. Other Aetna major product lines include: Pipe Mills (Seamless and Butt Weld); Continuous Coating Lines; Rolls; Drawbenches; Machinery for Rubber and Plastic.

SUBSIDIARY and ASSOCIATED COMPANIES

The Aetna-Standard Engineering of Canada, Ltd., Toronto, Ontario, Canada.
The Head Wrightson Machine Company, Ltd., Middlesbrough, Eng.
Societe de Constructions de Montbard, Montbard, France.
Demag Aktiengesellschaft, Duisburg, Germany.
Compagnia Italiana Forme Acciaio, Milano, Italy.
Aetna-Japan Company, Ltd., Tokyo, Japan.
Engineering and Development Corporation of the Philippines, Manila, P. I.
Hale and Kuligren, Inc., Akron, Ohio.
M. Castellvi, Inc., New York, N. Y.
Standard Engineering Co., Ellwood City, Pa.
Trans-World Traders, Inc., Pittsburgh, Pa.

Designers and Builders to the Steel, Copper, Brass, Aluminum, Rubber, Plastic and Chemical Industries

THE AETNA-STANDARD ENGINEERING COMPANY · PITTSBURGH, PA.

Aetna-Standard

PLANTS IN WARREN, OHIO · ELLWOOD CITY, PENNSYLVANIA

GOOD EQUIPMENT BRINGS DOWN PRODUCTION COSTS

Iron Age
FOUNDED 1855

14 times faster—

High-Output Plating Machine Incorporates Job Shop Flexibility

◆ Improved efficiency was the chief objective in getting an automatic machine to plate furniture components . . . But, it has done more than that . . . In terms of manhour requirements, it is producing 14 times as much work as by previous methods—and this rate can be stepped up.

By ALFRED D'AGOSTINO, Secretary, Albert's Plating Works, Inc., Brooklyn, N. Y.

◆ ONE of the largest fully automatic machines for job shop chromium plating was set into motion recently at Albert's Plating Works, Inc., Brooklyn, N. Y. Although designed primarily to plate quality tubular furniture components faster and at lower cost, the machine incorporates the completeness and flexibility which permit it to be converted quickly for plating other parts falling within the scope of job shop activities.

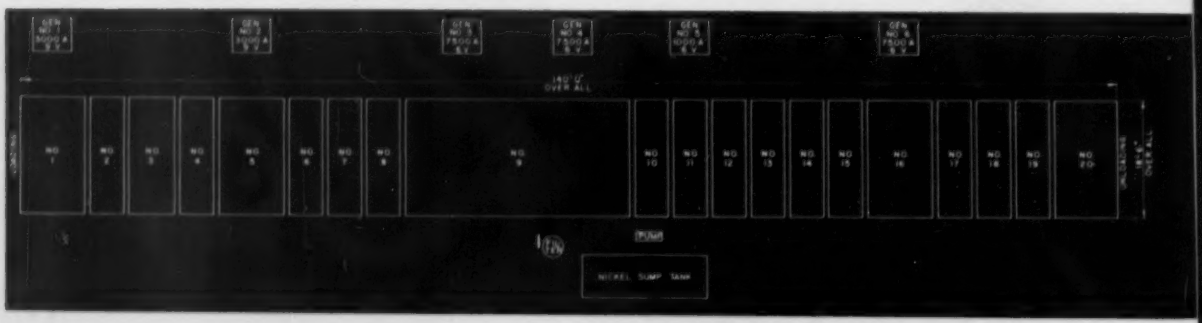
Constructed and installed by U. S. Galvanizing & Plating Equipment Corp., also of Brooklyn, the machine measures 140 ft long by 18½ ft wide by 18 ft high. In spite of its size, the entire mechanism can be moved by hand. Built on the "free crossbar" principle, it has a total of 25 crossbars. Each carries five detachable racks which are securely wedged for positive passage of current. Each rack in turn can carry from four to ten tubular parts, depending on their size and shape.

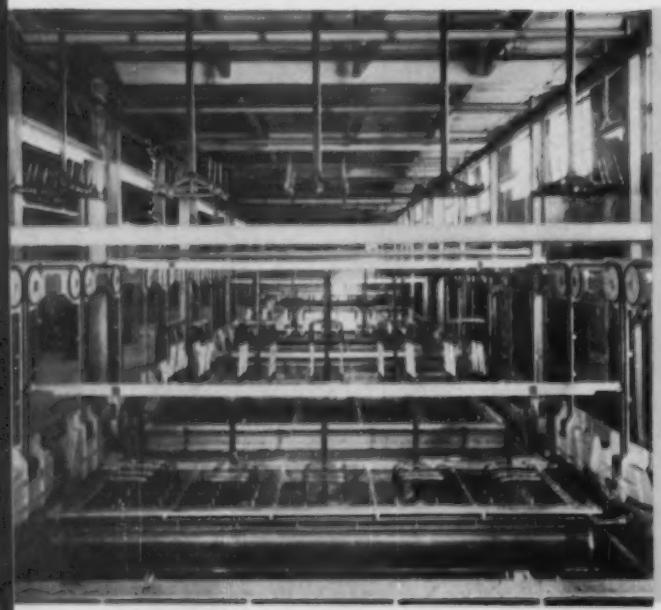
In loading the racks, parts are mounted on spring-type copper contacts which press outwardly against the inner tubular surfaces.

At present, the machine is running in "straight-away" operation, i.e., loading is done at one end and unloading at the other. However, this mode of operation can be changed by mak-

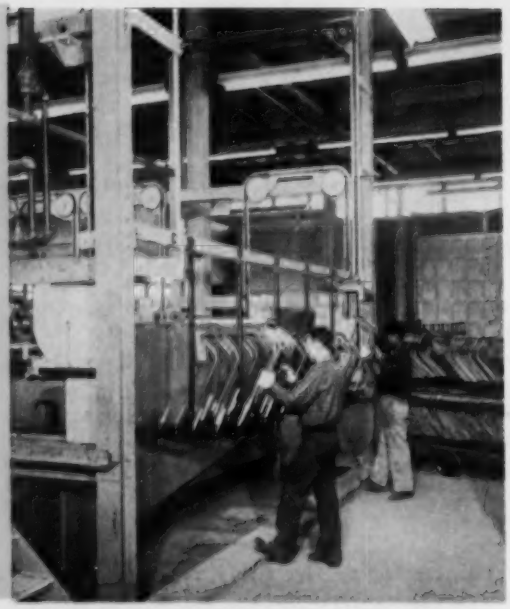
Plating Cycle and Layout

Tank	Solution	Time	Temp., °F	Tank	Solution	Time	Temp., °F
1	Alkaline electrocleaner	2 min	180	11	Activator	30 sec	165
2	Warm rinse	30 sec	140	12	Rinse and spray	30 sec	Room
3	Acid pickle	1 min 30 sec	140	13	Acid dip	30 sec	Room
4	Rinse and spray	30 sec	Room	14	Rinse and spray	30 sec	Room
5	Alkaline electrocleaner or copper strike	2 min	180	15	Rinse and spray	30 sec	Room
6	Rinse and spray	30 sec	Room	16	Chromium plating	2 min	100
7	Acid dip	30 sec	Room	17	Reclaim rinse	30 sec	Room
8	Rinse and spray	30 sec	Room	18	Rinse and spray	30 sec	Room
9	Nickel plating	15 min	125	19	Hot rinse	30 sec	180
10	Rinse and spray	30 sec	Room	20	Dry	2 min	180





OVERALL view from unloading end of machine shows parts as they emerge from chromium tank.



RACKS are loaded at rate of 125 per hour with four to ten furniture components per rack.

ing minor adjustments so that loading and unloading could be done from one end only. While the machine is in continuous motion, the crossbar carriers remain stationary during loading and unloading.

All mechanical movements are powered from a single integrated chain drive. With this type of drive, there is no possibility of machine breakdown or malfunction due to electrical failure of timing or other control devices. The drive is self-compensating in that the timing function will not be affected by the normal wear of its components.

Chains automatically lubricated

The main drive chains are equipped with automatic lubricators to minimize maintenance and assure trouble-free operation. These chains, as well as all transfer chains, are also equipped with either manual or automatic tensioners to provide smoother, quieter operation.

Ball and roller bearings are used throughout the machine. This, plus the balanced design by which some carriers are lifted while others are lowered, enables a single 5-hp motor to drive the entire machine.

Power for electroplating is supplied by six synchronous motor-driven separately-excited generators having a total capacity of 29,500 amp. They range in capacity from 1000 to 7,500 amp. All electrocleaning and plating tanks are supplied by separate generators with the exception of the nickel plating tank which is supplied by two 7,500 amp units. Remote control panels house all generator instruments and controls.

All electrified tanks have been well insulated from the machine frame, mechanical components and ground to avoid stray currents. Bus bars running under the machine are fully protected from drips and spray.

Each tank operating above room temperature is heated by steam coils which are isolated electrically. Temperatures of solutions are maintained accurately by automatic controllers at each of these tanks. At the nickel plating tank, the solution is heated externally. Rinse and spray tanks are equipped with automatic controls so that the sprays operate only when work is in the spray area.

The ventilating system keeps the plant completely free of irritating or noxious fumes. It is of the exhaust downdraft type with ducts built in under the tanks. In no way do the ducts interfere with plating.

In spite of the machine's size, maintenance is no problem. The machine was designed from the easy-to-get-at approach. The main drive chains are lubricated automatically. Other points can be reached easily without interrupting production. All mechanical and electrical equipment has been installed away from areas where corrosion or damage may occur.. Drip shields between tanks and spray deflectors around rinse tanks prevent damage to bus bars and ducts, at the same time, they eliminate dampness and add to general shop cleanliness. All tanks are mounted on waterproofed concrete dunnage with built-in retaining curbing and drains.

GENERATOR room delivers total capacity of 29,500 amp to the plating machine. Separate generators supply each electrified tank except in nickel plating where two are used.

Vary time cycle

All work passing through the machine at present is similar in nature. Nevertheless, provisions have been made for future requirements. For example, rotating work spindles or oscillating work carriers can be mounted on the crossbars easily and quickly if needed. Should work schedules require it, the machine can be operated with two or more different processes simultaneously. Accommodations can also be made for handling diverse sizes of work. The time cycle can be varied over a wide range.

During the plating operation, the parts move continuously. At the nickel plating tank, continuous circulation, filtration and external heating are functions performed in conjunction with a sump tank which is also used for solution makeup. After plating, parts are dried quickly in a recirculating type hot-air chamber.

Tank No. 5 can be used in either of two ways. It is now used for alkaline electrocleaning, but it can serve for applying a copper strike by changing from steel to copper anodes and minor changes in solution composition, giving a copper-nickel-chromium finish instead of the present nickel-chromium finish.

Manhour requirements to turn out an equivalent amount of work have been drastically reduced. Four men now plate twice as many furniture components in a single shift as were previously plated in two shifts, each having 14 men. At a nominal rate of 125 racks per hour, each holding 4 to 10 parts, hourly production ranges from 500 to 1250 parts.

Applied ingenuity—

Die Design Solves Small Part Production Problems

◆ Small stamped parts made from thin stock and with closely spaced holes often present special production problems . . . Good design can simplify both the building and operation of dies needed for these small parts . . . Result: Better production at lower costs.

By FEDERICO STRASSER, Consultant, Santiago, Chile

◆ SMALL STAMPED PARTS often present problems of both die design and die operation. These arise from close spacing of pierced holes, smallness of overall part dimensions, and in some cases from the thin stock used. Working space available in larger dies is lacking and some ingenuity is required in building dies which are both economical and capable of sustained, high production.

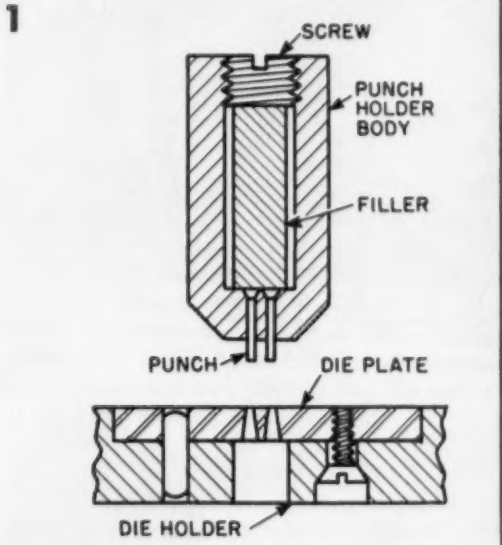
Where all holes must be punched simultaneously, because the relative position is important, a die and punch of the type shown in Fig. 1 may be used. The punch holder will accommodate several small round punches. The auxiliary die plate, secured to the die block by dowel pins and screws, simplifies machining and heat treating.

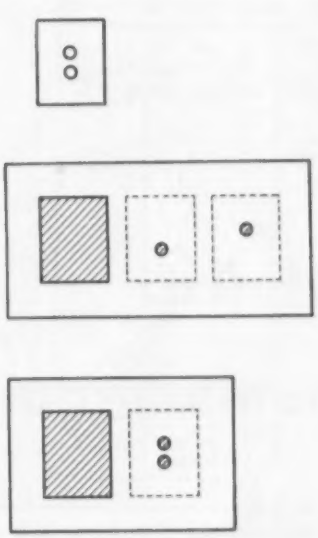
When the relative position of small holes is not of extreme importance, holes may be punched in two or more operations. Depending on conditions either operation is a punching combined with a blanking operation or a separate operation. It is necessary, therefore, to consider a progressive type die or a second operation punching die. The principles involved in producing a simple part, Fig. 2, can be applied to a workpiece with any type, form or number of punchings.

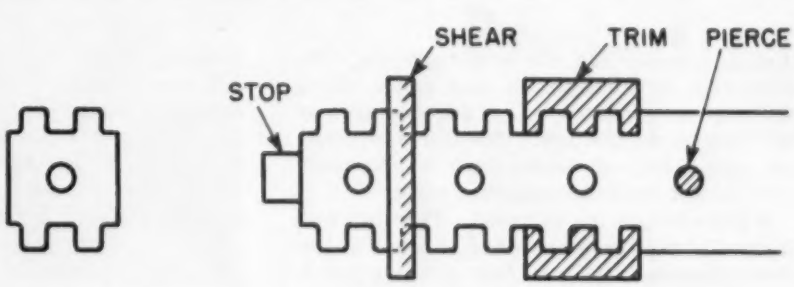
A part originally blanked with a rather complicated punch, is now made more easily and cheaply with a trimming and shearing die, Fig. 3. The tendency of trimming punches to bend outward, stressing the punch, may be avoided in two ways. A punch heel which enters the die before the punch touches the stock, will support the punch during the trim. A 5° or 6° bevel on the face of the punch will also counteract the tendency to bend away from the stock. Exact bevel depends on material and hardness and may be determined by trial.

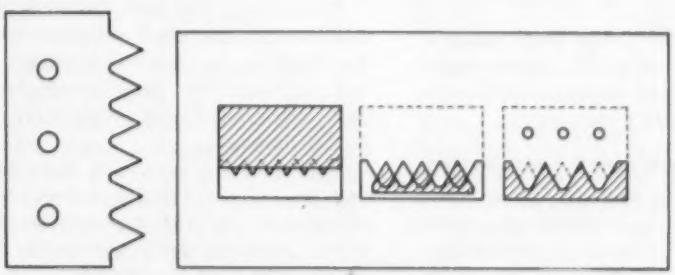
To produce a workpiece from 0.004 in. stock with sharp teeth, Fig. 4, proved a problem.

MR. STRASSER, well-known consultant and author, is presently in charge of tool and die design for a Chilean manufacturer of electrical and plastic components.









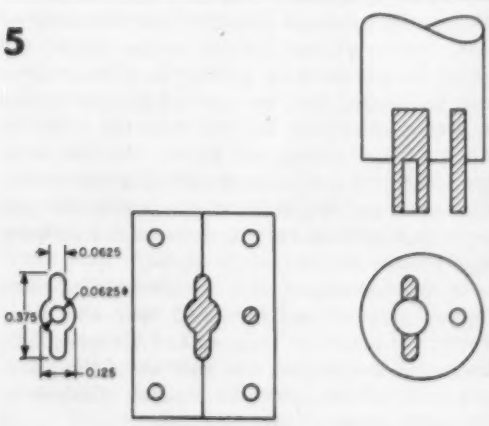


FIG. 1—This punch design simplifies location of several piercing points in small area.

FIG. 2—If tolerances permit, progressive piercing (center) may be used for close holes.

FIG. 3—Many contoured parts can be made using low cost trim and shear die construction.

FIG. 4—Saw teeth were cut easily in part (made from 0.004 in. stock) with double operation.

FIG. 5—Sectionalized die plate inserts simplify machining and heat treating die parts.

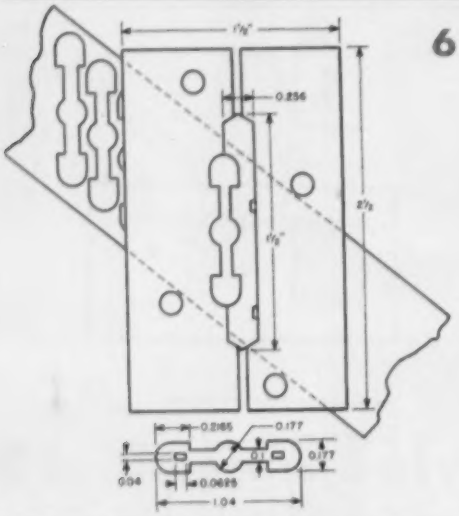


FIG. 6—Improved clamping, better hole alignment were possible using sectional die construction.

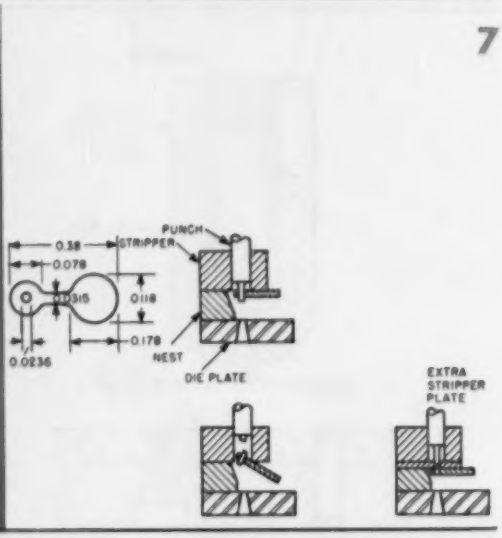


FIG. 7—Extra stripper plate eliminated punch breakage in this piercing operation.

Making punches and dies with teeth was difficult, even if sectionalized, and punch edges did not retain sharpness. A double-operation die proved satisfactory. The die was based on punch teeth of double pitch which would overlap and form the completed teeth.

A three station die was used. The work was pierced at the first station and trimmed at the first and second stations. One trimming punch cuts the roots of the teeth and the other cuts the crests. At the third station the workpiece is blanked.

The part shown in Fig. 5 was made using a two-station progressive die. To avoid much tedious hand filing, a two-piece sectional die was machined quickly with a shaper.

Novel punch construction

The punch is a round tool-steel body with two small holes, 0.125 and 0.0625 in. diam respectively, made at the correct center-distances, 0.1875 in., to correspond to the exact "pitch-distance." All material at the depth of 0.20 in. was removed save that corresponding to the long tongue, 0.0625 in. x 0.375 in., of the blanking position. After having hardened the punch, two pieces of hardened drill-rod of 0.125 and 0.0625 in. diam respectively and of the correct length, were put in their respective holes and the punch was then ready.

While composite dies offer advantages over solid dies, it is sometimes difficult to maintain alignment between sections or provide proper section clamping. With large dies it is comparatively easy to locate an adequate number of dowel pins and clamping bolts. In very small dies this is seldom simple.

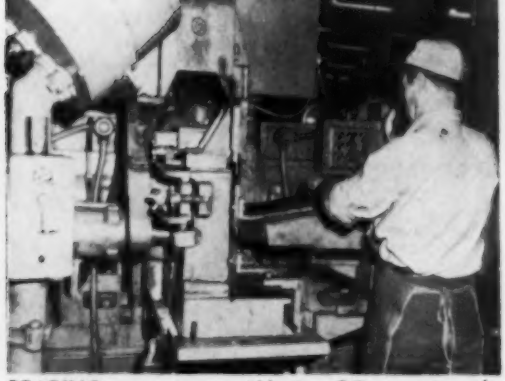
The part shown in Fig. 6 was made from very thin phosphor bronze. In designing a small progressive die, a sectional die construction was used because of the small dimensions and close tolerances. Strip layout and location of the strip in the die are shown. In the die proper there are three parts. The center section is chamfered at both ends to mate exactly chamfered corners in the two lateral sections. These lateral sections are wide enough for adequate clamping and alignment holes. A strong welded form (not shown) binds the three sections together.

To produce the part shown in Fig. 7 from 0.0313 in. gage steel required two dies—one for blanking and one for piercing. The blanking operation was satisfactory but the piercing operation failed completely because of punch breakage.

Phases of the punching cycle are shown in Fig. 7. After having completed the piercing, the punch ascends and carries the adhered blank upwards until the latter touches the lower surface of the stripper.

The point of the workpiece was pushed into the guiding hole of the punch in the stripper and, being wedged at an angle, broke the small fragile piercing point. This failure was due to the fact that the body of the punch had a greater diameter, 0.1 in., than the 0.078 in. diam of the workpiece itself. At the same time, the nest had a comparatively great height. Consequently, the point of the workpiece was able to enter the guiding hole in the stripper and become wedged at an angle.

A supplementary thin stripper-plate, made from tool steel and hardened, was added between the principal stripper and the nest. This improved the support and guiding of the piercing point of the punch as well as eliminating the basic cause of breakage.



BEARING races over 1¼ in. OD are trough-loaded for automatic feed to vertical grinding wheels that grind both faces simultaneously. Smaller races feed automatically from the hopper at upper left when they are processed.

CENTERLESS grinder uses an air-actuated mechanism to feed the grinding wheel to the work.

On precision parts—

Grinding Improvements Boost Production

◆ BALL BEARINGS in a variety of types and sizes are important products of the West Pullman Works of International Harvester Co., Chicago. Races for these bearings are machined from seamless steel tubing on automatic screw machines but then have to be ground on nearly all surfaces for dimension and finish.

Among the race grinding operations are those done on both faces. Until recently this was done on conventional surface grinders having two horizontal wheels. Races in rows of three were fed rapidly under the wheels on a rotating table. After grinding the top face, the races were turned over, the wheels readjusted and the second face was ground. This involved extra handling and time for the second pass.

Recently, the department doing this work has installed a Besley grinder which has two vertical wheels set so that they grind both faces in a single pass. The machine holds the same thickness limits (0.001 in.) and the same parallelism (0.0003 in. max deviation) as the grinder formerly used.

With the new machine, production on typical races above 1¼ in. OD is 85 to 100 pieces a min. This is about 70 pct faster than before. Feed is from a trough, into a slide and onto a chain that advances each race between the two wheels. Races below 1¼ in. OD use a hopper feed via a magazine to achieve a still faster rate. It requires only 45 men to set up the grinder.

Of the centerless Cincinnati grinders used for other work in this department, one is equipped with a Bellows air feed. A rack moved by the piston engages and rotates a pinion. The rotating pinion turns a nut that feeds the grinding wheel in and out.

Motion of the rack is controlled by the grinder operator with push buttons near his left hand, leaving his right hand free to load work pieces. Normally, the wheel is brought up to the work rapidly. As soon as cutting starts, the feed is slowed until the work piece is ground to the specified OD.

Wheel return is controlled automatically by a timer, but if an oversize piece happens to be loaded, motion can be reversed and the wheel moved back quickly by pressing a safety button.

Whenever the wheel is redressed, it is a simple matter to reset the feed controls. The air operated feed tends to increase production rates by reducing operator fatigue.

For maximum productivity—

Plant Combines Standard and Special Machine Tools Efficiently

◆ Both general purpose and special machine tools have a place in modern mass production . . . Westinghouse combines both types to achieve utmost efficiency and economy at its new air conditioner plant.

◆ First requirement is to get the best equipment for any machining job . . . Automatic cycling controls are used for maximum output and quality . . . Machines are carefully grouped to reduce part handling.

◆ THREE IDEAL MACHINING conditions are almost universally applied at Westinghouse Electric Corp.'s new air conditioner plant at Staunton Va. First, the best and most modern equipment is installed for each machining job. Second, automatic and semiautomatic machine tools are used so that machining cycles can be preset for maximum productivity and part quality. Third, equipment items are grouped according to a plan that minimizes part handling between operations.

The job of machining compressor crankshafts illustrates how these ideal conditions are applied. To avoid rough machining, the crankshafts are initially shell-cast. This keeps the amount of metal to be removed within economical grinding limits.

A centerless grinder finishes two different diameters and the bearing shoulder of the long end of the crankshaft in one operation. The throw end and shoulder are finished by use of a fixture in a standard cyclindrical grinder. This operation is followed by multiple drilling, reaming and tapping of the throw end of the shaft for the counter-weight.

When an operator campletes a shaft he places it in a conveyor basket. When full, the basket is moved just three ft. and attached to the overhead conveyor. The conveyor carries the parts through a degreasing operation and thence to the assembly area.

Where gas tight fits are required, the parts are surface ground rather than turned to the required microinch finish and close tolerances. These operations are usually faster than the conventional turning operations because multiple parts can be surface ground simultaneously.

Connecting rods are bored, drilled, and reamed to tolerances of 0.0005 in. in a special automatic time-cycle machine. They then go to a semi-automatic miller where a number of rods are milled at one time. Next the bearings are pressed in, the oil holes are drilled, and the bearings are sized on a Borematic machine.

Complete machining of the bearing housing is performed with only three handlings of the part and all operations are cycled to obtain maximum productivity. The housing is turned, bored, back faced and drilled to tolerances of 0.001 in. in a semi-automatic turret lathe. While this opera-

FRAME parts are positioned in jigs and held by air clamps for arc welding operations.

tion is being performed on one housing, the operator presses the bearings in another on a hydraulic press. He then places the housing in a precision boring machine where the bearings are machined to very close tolerances.

All machined parts required for compressor assembly are placed on the overhead conveyor in the machining section and travel through a washing, cleaning, and degreasing operation to the assembly area. This eliminates the problem of handling the parts from operation to operation.

The major item of the compressor, the integral motor housing and compressor case, is completely machined in three handlings. Handlings 1 and 2 and their related machining operations are performed in a special Cross Transfer-matic machine which is tooled to produce 18 pieces per hour at 100 pct efficiency. The machine is equipped with pallet-type, two-position, work-holding fixtures.

The rough casting is first loaded in a horizontal position in the fixture. Foundry spots insure correct location in the fixture. After loading in Station 1, the pallet is transferred to Station 2. Here a single spindle boring head with a multiple blade carbide cutter roughs and finishes the stator bores. This cutter also roughs and finishes the inside bearing mounting face.

In Station 3, two milling heads machine both ends of the compressor case. These are single spindle heads each carrying a 14-in. diam carbide tipped face mill. The cutters run at 300 sfpm, with a feed rate of 11 ipm.

In Station 4, bolt holes in both ends of the compressor case are drilled simultaneously. There are no further operations while the case is in the horizontal position until Station 10, where bolt holes are tapped. This tapping completes the machining in the horizontal position and the case is then transferred into loading position 2 on the pallet type fixture.

In Position 2, the part is located radially on the bearing bore. Vertically, it is positioned on the bearing mounting face by means of a single small locating pin in one of the holes previously drilled. There are no operations on the vertically-positioned part in Stations 2 or 3.

In Station 4, two single-spindle heads core drill the piston bores. These heads have special carbide-tipped, spade-type core drills. The tools leave approximately 0.025 in. for finish boring.

In Station 5, two-spindle milling heads rough

CABINET and frame parts are cut on shears and formed on presses, move to conveyor (right).

TRANSFER machine applies 160 tools to compressor case forgings, completes 18 cases per hr.

SPECIALLY designed induction brazing machine brazes 36 condenser joints in four minutes.

and finish mill the cylinder head faces with 10 in. diam carbide-tipped face milling cutters. Rough and finish cuts are used to obtain a specified microfinish of 80 rms.

In Station 6, two single-spindle precision boring heads finish the piston bores. To hold the 0.001 in. size tolerance a microfinish of 40 rms, these heads bore both ways.

In Station 7, two multiple-spindle drill heads drill all holes in the cylinder head faces and in Station 9, the same holes are tapped. In all, there are 160 individual tools that machine the compressor case.

After the pallet is return-conveyed to the front of the transfer unit, the part is removed and sent to another special machine for an additional milling operation. The compressor case is then placed on the conveyor for cleaning, degreasing and delivery to the assembly area.

Chips conveyed automatically

The transfer machine is designed and tooled to handle two different size compressor cases. The heads at Stations 4, 7 and 10 are double-end turret types mounted on the saddle of the way-type hydraulic feed units. A pilot on the saddle positions these heads. Other heads which must be changed over for the different size cases have positive stops and pre-positioned trip devices to actuate the necessary 4-way valves.

The transfer machine has an automatic chip conveyor, which delivers chips into a hopper at the rear of the machine. The machine also has three automatic lubricators. Two of these provide air-oil mist for the heads; the third is a high pressure automatic unit for the ways of the various units.

The electrical control panel provides full interlocks for maximum safety and protection of the machine and the operator. Automatic operation is from a small push button panel located at the loading station. The master push button station may be used for setup work or when changing over the machine.

A Cross machine control unit provides for maximum operating efficiency and proper tool facilities. It includes a master control board which is divided into areas for each tool head or unit on the machine. These areas are subdivided into sections for each type of tool in the various heads. Each section contains a tool setting gage, storage space for two sets of tools, a tag to identify tool and holder numbers, and a Toolometer.

Tools are preset to standard lengths in adjustable holders. This permits replacement of a dull tool in as little as two minutes. The Toolometers schedule or program these tool changes. In addition, they provide visual records of used and unused life of each type of tool.

The Toolometer pointers index counter-clockwise with every machine cycle. When any pointer reaches "zero," the machine automatically stops. Red areas on the dials are "danger zones" and represent the last period of useful tool life. When the machine stops, the "zero" tool and all those in the "danger zone" are replaced to minimize downtime.

The manufacture of evaporators, of the plate-type design using aluminum fins and copper tubing, is also done in a self-contained area on specialized equipment. Coiled aluminum stock is automatically processed into fins on a 30-ton Bliss punch press operating a two-station progressive die at 170 strokes per minute.

Adjusts for different sizes

Fins are punched in the first station and the collars are formed in the second station. An adjustable automatic counter on the press then cuts the formed fin stock to a predetermined length, depending upon the size of the evaporator being made. Also operating through the necessary controls is an indexing table on which the cut fins fall.

Height of the fin stacks is adjusted automatically depending upon the particular evaporator requirements. The only attention required of the operator is to load the coil stock, adjust the counters for the proper length of fin and the proper number of fins per stack, and to remove the finished fin stack from the indexing table.

The copper tubes, cut to length and with one end belled, are then inserted into the stack of fins and evaporator supports. This whole assembly is then jigged. The jig insures squareness and alignment while the other ends of the copper tubes are being belled by a suspended portable, airoperated expander.

Expander rods with special heads are mounted in a hydraulically-operated carriage. The rods enter the tubes, expanding as they enter and then expanding further to a total of about 0.014 in. on the withdrawal stroke. From 30 to 48 tubes can be expanded simultaneously. The evaporator then moves to a station where the return bends and headers are welded.

Return bends for evaporators are manufactured on a Pines automatic machine.

With staggered stands—

New Merchant Bar Mill Equipped for Maximum Versatility

◆ Operators of the new merchant bar mill at Phoenix Mfg. Co., Joliet, Ill., are confident of increasing original output ratings . . . Staggered roll stands combine "cross country" versatility with the rapid travel of a single or double strand repeater operation.

◆ Y-tables use sweep-arms instead of skew rollers to traverse and control bars for entry into successive roll stands . . . Double-channel, jump-type repeaters mounted on ways, are always in location . . . Spare stands are kept ready for a 45-min. mill changeover.

By R. A. PETERSON, Consultant, Cleveland Heights, Ohio

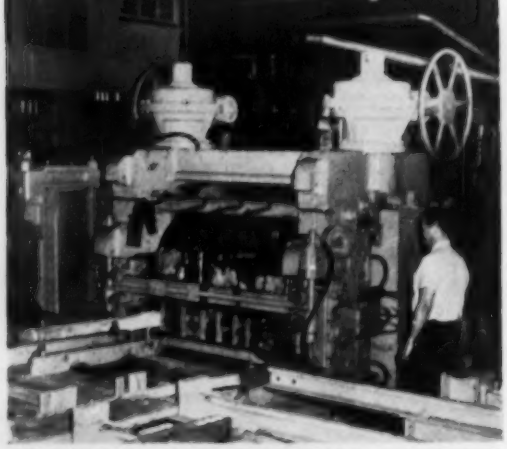
◆ ACTUAL PRODUCTION experience with the versatile new merchant bar mill recently installed by Phoenix Mfg. Co. suggests that original output ratings may be increased considerably.

The new mill at the company's Joliet, Ill., plant is delivering light bar stock at over 2000 fpm. In an hour's time, it will roll up to 45 tons of 3½ in. rounds, or 10 tons of ⅜ in. rounds.

But mill operators believe the 10-ton rating for ⅜ in. material can be boosted to 17 tons per hour as the mill comes into full operation. This is because the finishing mills combine the versatility of a "cross country" merchant mill with the rapid travel of a single or double strand repeater operation.

Basically, the new mill consists of a reheating furnace, a primary three-high breakdown mill, an intermediate mill unit of four two-high stands and a finishing mill unit with two, two-high stands in staggered arrangement. The finishing mill is followed by a 250 ft single bank mechanical cooling bed, and then by a shearing operation which cuts bars to final length for storage or shipment.

"Billet stock is end-charged into the high end of the re-heating furnace . . ."



DISCHARGE side of 20-in. breakdown mill which can make 3, 5 or 7 passes on the hot bar.

The Flinn & Dreffein continuous type reheating furnace, with a 17 x 50 ft inside hearth and two-zone firing, is used to heat billets and axle stock. Its burners use either natural gas or Bunker C fuel oil, or a combination of both. Though originally rated at 30 tons per hour, the furnace has already operated at a 40 ton per hour rate, and 50 tons per hour seems attainable.

Billet stock is end-charged into the high end of the furnace, and is pushed down the hearth past pyrometers which establish and record the steel temperature. At the discharge end of the hearth, heated billets are side-discharged by a manually directed, air operated ejector and a pinch roll unit.

The ejector pushes the billets across the hearth into the pinch rolls which are mounted just outside the furnace discharge door. The rolls pull the billets out of the furnace and deliver them onto a roller table which has an end stop to limit billet travel.

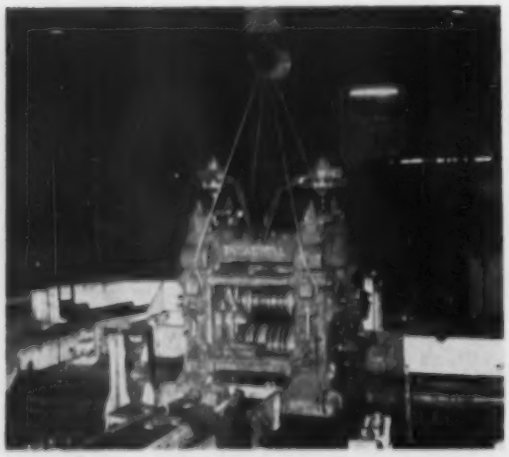
A motor driven carriage above the discharge table can be used by the pulpit operator to return a billet back through the pinch rolls into the furnace. This is done if any trouble occurs before charging a billet to the bar mill.

Sprocket-driven chains move the hot billets across the furnace discharge table and then across the rail of the billet transfer. From the transfer, billets drop onto a Bliss live-entry table to the three-high breakdown mill.

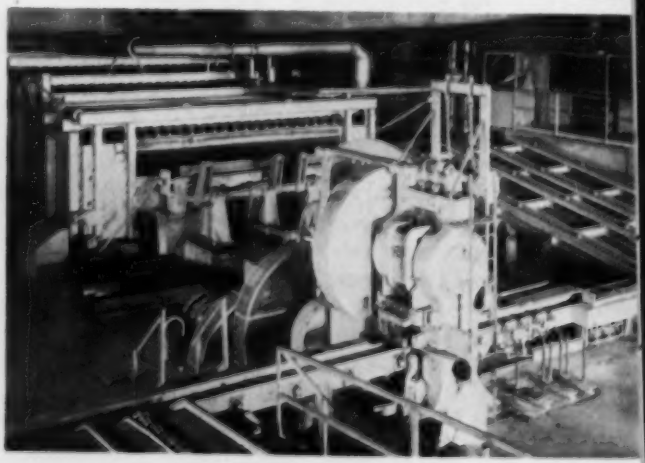
This live-entry table has 6 ft long rollers to serve the entire range of passes in the breakdown mill. It works in conjunction with a Bliss tilting table located on the opposite side of the breakdown stand. The live-entry table enters all odd number passes into the bottom pair of rolls, and the tilting table receives all odd number passes from the bottom pair of rolls and delivers all even number passes to the top pair.

The three-high breakdown stand has rolls 20 in. in diam by 72 in. long. Rolls are driven by a 1500 hp dc motor through a 2 to 1 speed reducer and a 19 in. pitch diam pinion stand to turn at speeds from 60 to 120 rpm. This speed range is convenient for handling 1¾ to 8 in. sq billets as well as a range of axle sizes.

The pulpit operator controls the direction of travel of the live entry and tilting tables. Pass



LOWERING a standby roll stand into position. Complete 6-stand changeover takes 45 minutes.



BILLET shear with gas or oil-fired continuous type reheating furnace in background.

design is such that the bar reverses itself on all passes made from the tilting table. Automatic bar turning is being provided on the live-entry table from the odd to the even passes. The breakdown mill can make 3, 5 or 7 passes on the bar, depending upon the billet size and finishing mill speed desired. Billets enter the mill at about 2200°F.

From the breakdown mill the hot bar travels on a roller table line to the first stand of the staggered 6-stand Treadwell mill. The roller table is about 160 ft long beyond the tilting table of the breakdown unit. It is of the individually driven roller-type, and is divided into units to serve two functions.

When six passes are required beyond the breakdown unit, a portion of the table pivots to deliver the bar to the first of the six roll stands. When four passes are required beyond the breakdown unit, a portion of the table pivots to deliver the bar to the third of the six roll stands.

A shear between the breakdown stand and the six-stand unit is installed in the table line for cropping or dividing the bars. It is of the down-cut type, cutting a stopped bar.

The staggered six-stand mill unit has the following nominal roll diameters and body lengths: stands 1 and 2, 12 x 30 in.; stands 3 and 4, 12 x 24 in.; stand 5, 10 x 24 or 12 x 24 in.; stand 6, 10 x 20 or 12 x 24 in. All six stands are of the two-high type.

Complete change in 45 minutes

Stands 1 and 3 are direct-driven through one 12 in. pitch diam pinion stand by a 700 hp dc motor at speeds varying from 175 to 525 rpm; stands 2 and 4 duplicate this setup. Stands 5 and 6 are each driven direct through 10 in. pitch diam pinion stands by 600 hp dc motors at speeds varying from 250 to 750 rpm. Bar delivery speed can vary from about 600 to about 2100 fpm.

To minimize delays due to change overs, the mill has a complete spare set of 10 and 12 in. roll stands. While rolling takes place, these spare stands are readied for the next roll setup. When an order is completed, foot-bolts are loosened and the recently used roll stands lifted out of position by a 15-ton overhead crane. The stand-by mill stands are then lifted in place. This complete change-over can be made in about 45 min.

The staggered six-stand unit is arranged so that it can be served by Y-tables for handling sections which must be reversed, or by repeaters for single or double strand repeater operation.

Five Y-tables serve the six stand unit. They are different from ordinary Y-tables in that they do not use skew rollers to traverse the bar laterally to the next roll stand. The tables vary in length from about 70 to 210 ft. A driven sweep-arm pushes the bar across the roller table for entry into the next roll stand.

One advantage of this system of reversing is that the bars are under better control. Birdsboro tables are used for the reversing operation in these six roll stands with their electric eye-operated plug twisters.

Five Birdsboro repeaters serve to repeat bars from one stand to the next in this six-stand unit. They are different from many repeaters now in use in that they are always in location, whether or not repeating takes place. Mounted on ways, they traverse hydraulically to serve the passes used.

Repeaters minimize setup time

The repeaters are of the double channel, jump-type for single or double strand repeater operation. Double strand repeating will occur with rounds from 3/8 in. through 11/16 in. Repeating takes place completely with 3/8 in. rounds and partially through 1 in. rounds.

For a reversing operation the repeater traverses on its ways both to line up a passage to the Y-tables and also to automatically traverse the plug twisters into position. One advantage of always having the repeaters in place is that it minimizes the set-up time when going from a reversing to a repeater operation or vice versa. Repeaters are served with infinitely variable plug twisters and double solenoid operated snap shears.

All bars are finished in the sixth stand of the six-stand unit. They are delivered to a 250 ft single bank Birdsboro cooling bed equipped with two run-in roller tables, one mounted above the other for handling one or two bars simultaneously. The cooling bed also has the regular carryover and shuffle bars to deliver cooled bars to the cold runout roller table line.

All rollers on the double run-in roller line are individually driven to run at a speed which is about 10 pct above the particular bar delivery speed at any time. Bar kick-off is accomplished electrically by use of insulated rollers to provide maximum coverage of available cooling bed area.

Immediately following the six-stand mill unit is a Birdsboro double flying electric shear for cutting bars to hot bed length. Either shear can cut a hot square up to 1¼ in. The double shear serves when double strand rolling.

Bars which accumulate on the cold runout table of the cooling bed are delivered to a Birdsboro bar shear for cutting to customer lengths. The back table that serves this shear is equipped with automatic gages and kick-offs for handling cut lengths up to 60 ft.

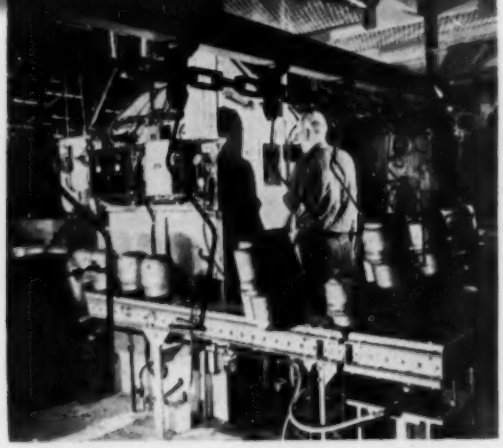
In addition to the existing mill equipment, two stands will be added to the present three-high breakdown stand. This line will then consist of two 20 in. three-high stands and one 20 in. two-high stand. It will be outfitted to roll rounds up to 4 in. in diam, also heavy flats, and such sections as large beams, channels and angles.

Cuts handling—

Mechanized Welding Line Assures Uniform Quality

♦ **Compressors for air conditioners and refrigerators are made by the tens of thousands monthly at York Corp. . . . To obtain consistent quality in joining compressor housings to covers, welding is done on a high-speed line . . . Conveyors carry components through cleaning, welding and testing cycles . . . Grooves are joined to housings by inert gas-shielded metal arc welding.**

By C. F. STEPHANSON, Chief Industrial Engineer, York Corp., York, Pa.



OPERATORS working at two welding booths can produce more than 1000 compressors per day.

WELDING 27.3 in.-long circumferential seam of steel compressor housing takes 23 seconds.

CONVEYOR-carried compressors are dipped into illuminated water tanks to test for leaks.

◆ CONSIDERING that roughly 50 pct of the production cost of an item goes into materials handling, York Corp., York, Pa. has applied as much mechanization as possible in making fractional horsepower compressors for air conditioners and refrigerators. With production running into tens of thousands of units per month, the chief objective was to acquire greater consistency in product quality—and at a cost saving.

An operation of major importance in the high-speed line is the joining of the compressor cover to the housing. Originally, this was done by brazing. In the new setup, this operation is performed by inert gas-shielded metal arc welding, using Aircromatic heads equipped with automatic controls and special jigs for mounting the compressors.

Before welding, the two stampings are hung on hooks extending from an overhead chain conveyor. While on this conveyor, the stampings are taken through an elaborate cleaning cycle. It involves alkaline degreasing, hot water rinsing, phosphoric acid derusting, cold water rinsing, recirculating cold water rinsing, and neutralizing hot water rinsing at 150° F in a bath to which is added 3 oz sodium nitrate to 100 gal of water. Stampings are oven dried.

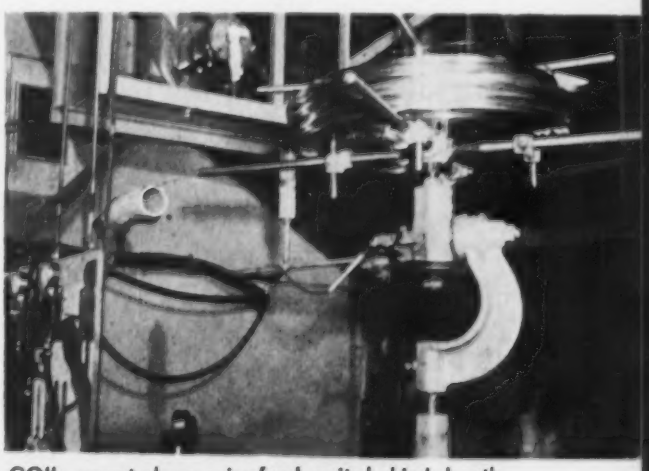
From cleaning, the compressor stampings move on to the assembly line where the machinery, consisting of an electric motor and two pistons are built up. Two tests are then applied to the assembly—a sound test and a motor test. Next, nitrogen is injected into the compressor to displace the air, thus avoiding oxidation during welding.

The welding operation takes place in a welding booth. Once the two stampings, which are made of aluminum-killed, fine-grained, deep-drawing steel, are fitted into the jig, welding of the circumferential seam is done in 23 seconds. Total length of the weld is 27.3 in. To make the weld, the machine is set for 530 amp dc, using reversed polarity.

The weld zone is protected against atmospheric contamination by a gas mixture consisting of argon with some oxygen. Welding wire of 3/32 in. diam A-675 steel is used.

After welding, the compressors are hung on a new conveyor system on which they move to a weld testing station. Here, internal pressure is applied and pulsated for a predetermined length of time. While on the same conveyor, the compressors move to an illuminated water tank into which they are dipped and checked for leaks. Detection of leaks is a simple matter since the compressors at this point are still under an internal pressure. Rejects are few, but those which show leaks are repaired by manual arc welding.

From this point, the compressors again pass through a series of conditioning processes to prepare them for dip painting. After painting, they are moved through a dehydration oven. In the final operation, the compressor is charged with dry nitrogen, then sealed.



COIL mounted on wire-feed unit behind booth feeds A-675 mild steel wire to welding setup.

Control oil losses—

New Lubrication Material Conserves Bearing Oil

◆ EXTENSIVE TESTS conducted by established engineering laboratories under rigidly controlled conditions indicate that the use of a new type wicking material and oxidation resisting oil may multiply the oil-retention characteristics of bearings under light loads by more than 4 times.

The new type lubrication material called Permawick was developed by Congress Drives Div., Tann Corp., Detroit, Mich., after more than three years of research and development.

The new development is said to permit controlled, but adequate oil flow at all times, freedom from clogging of the pores of sintered bearings and to resist excessive end losses of oil. The new material is also reported to have sufficient tenacity to resist the high suction forces encountered in sintered bearings.

Eliminates hand feeding

Permawick can be injected into bearing reservoirs through small holes very much like greases. This eliminates the need for using die cut felts and hand feeding into reservoirs. It can be made up with specialty oils as well as the synthetic lubricants.

Up-to-date laboratory data show bearings tested with Permawick give as much as 4000 to 5000 hr without reoiling in home furnace blower tests.

According to Tann Corp. engineers, their ability to control end losses of lubrication from bearings by the use of a wick material represents a new approach to the bearing problem that has not heretofore been attempted. Patents are pending on the new development.

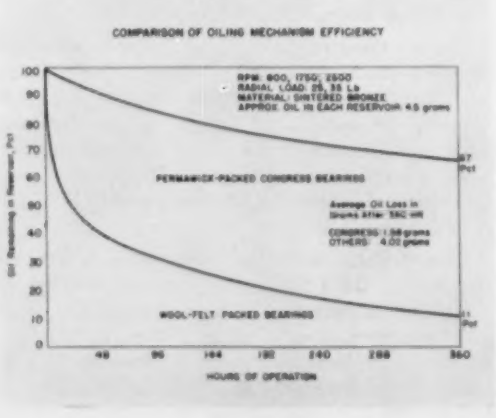
A comparison of the oil retaining characteristics of wool-felt packed bearings and Congress bearings containing Permawick wicking material is shown in the accompanying diagram. Tests included runs at 800, 1750 and 2500 rpm with 25 and 35 lb radial loads. At the end of 360 hr, the Congress bearings retained more than 5 times as much oil as conventional wool-felt packed bearings.

An outstanding characteristic claimed for Permawick bearing lubricating material is ability to resist oxidation and forming of gums. This minimizes the possibility that products of oxidation will imbed themselves in the pores of the sintered bushing.

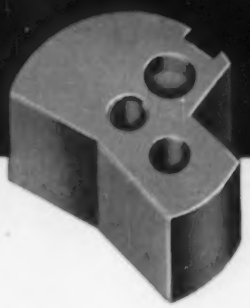
Another advantage claimed for the new wicking material is ability to resist oil loss during the break-in period. Excessive build-up of residue products formed during the difficult break-in period when temperatures are often high is avoided, it is contended.

Ability to conserve bearing oil has been increased by 300 pct and upward where the new wicking material is used in conventional bearings, Tann engineers say.

An unusual characteristic of the new wicking material is the fact that millions of porous cells are induced to absorb many times their own weight in oil. These tiny cells let their oil charge go reluctantly, assuring long life of bearings while supplying adequate lubrication.


COMPARISON OF OILING MECHANISM EFFICIENCY
RPM: 800, 1750, 2500
RADIAL LOAD: 25, 35 Lb
MATERIAL: SINTERED BRONZE
APPROX. OIL IN EACH RESERVOIR: 4.5 grams
PERMAWICK-PACKED CONGRESS BEARINGS
WOOL-FELT PACKED BEARINGS
HOURS OF OPERATION

From the collection of Lewis Winant, New Jersey Arms Collectors Club. Maker: Wogdon, London, 1786-1787. An 11-by-14 inch print of this illustration will be sent free when requested on company letterhead.



challenge accepted

When this booster rotor, an artillery fuse component, was offered for production to the powder-metallurgy industry, Bound Brook was among those who were quick to accept the challenge. Initially, the part had been produced by machining brass bar stock, a method which proved to be both excessively costly and discouragingly slow. Powder metallurgy fabrication looked simple enough at first, until the critical weight and dimension factors were examined more closely—for in artillery fusing the difference between a hit and a dud can depend on a thousandth of an inch. By mustering all of its know how, accumulated in more than 30 years of producing metal-powder parts, Bound Brook emerged as the major producer of this rotor—at a cost nearly 40% less than was required for conventional machining.

10

BOUND BROOK

BOUND BROOK OIL-LESS BEARING CO., EST. 1883, BOUND BROOK, N. J.

Pioneer in

POWDER METALLURGY BEARINGS & PARTS

New Technical Literature:

Catalogs and Bulletins

Leather for industry

A booklet describing leather products for industrial uses has been published. Products include: hand guards, protective aprons and tool holsters. Prices, sizes and other specifications are included. Also described is a new product, a liquid belt dressing which comes in an aerosol can for safety of application. *Graton & Knight Co.*

For free copy circle No. 1 on postcard, p. 97.

Compressed air

The first six pages of this bulletin comprise a handbook with hook-up sketches to help users of compressed air to improve the capacity of their installations. Also described are cooling controls for compressor jackets, aftercoolers and intercoolers, drain traps, electric thermostats and pressure switches. *Sarco Co., Inc.*

For free copy circle No. 2 on postcard, p. 97.

Stainless steel

Brazing and processing stainless steel is the subject of a booklet which describes some of the special facilities necessary to successful brazing of steel. Also described in the second section of the booklet is a stainless steel brazing alloy which is heat and corrosion resistant. *Stainless Processing Div., Wall Colmonoy Corp.*

For free copy circle No. 3 on postcard, p. 97.

FOR YOUR COPY

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, page 97.

Fused silica

Fused silica, which is resistant to high temperature and thermal shock, acid proof, and has exceptional electrical insulating value is described. Applications and properties are given, plus general information. Types of equipment available in Rotosil fused silica are illustrated. *Amersil Co., Inc.*

For free copy circle No. 4 on postcard, p. 97.

Gamma radiography

A 12-page booklet presents basic information required for setting up or operating a gamma-radiography installation; tells how to select the proper radioisotope for handling equipment, and discusses the principles of radiation safety. Tables and charts show characteristics, radiographic sensitivity, and speed of the isotopes. The brochure was designed to have lasting reference value to manufacturers interested in gamma-ray inspection. *Technical Operations, Inc.*

For free copy circle No. 5 on postcard, p. 97.

Rheostat

Design features of the liquid rheostat Type 257 employing a complete NEMA 1 enclosure and other improvements are described. The rheostat is designed to provide accurate, stepless, wide-range speed control of wound rotor motor drives and is particularly suitable for speed regulation on variable torque applications. *Allis-Chalmers Manufacturing Co.*

For free copy circle No. 6 on postcard, p. 97.

"Pete's really 'in the chips since we started using MOLITE® SMOOTH CUT!"

COLUMBIA TOOL STEEL COMPANY • CHICAGO HEIGHTS, ILL.

Producers of fine tool steels — All types immediately available through Sales Offices, Warehouses and Representatives in Principal Cities.

TOOL COLUMBIA STEELS

FREE TECHNICAL LITERATURE

Smoke density indicator

The Fireye smoke density indicator system FE-3 and auxiliary smoke density recorders, series 55, are described in a bulletin. The system provides continuous, accurate monitoring of smoke discharge and overall indication of combustion efficiency. It helps to keep smoke discharge within limits of all smoke control and air pollution ordinances. *Combustion Control Div., Electronics Corp. of America.*

For free copy circle No. 7 on postcard, p. 97.

Hermetic seal

A new type of engineering bulletin cutting across the usual connector lines includes in one catalog all current material on Canseal hermetically sealed types. Used largely for aircraft instruments but also adaptable for a wide variety of applications requiring a hermetic seal, also for use in high temperature installations and under moisture environments, these types all have steel shells and contacts with fused glass insulation. *Cannon Electric Co.*

For free copy circle No. 8 on postcard, p. 97.

Reciprocating boosters

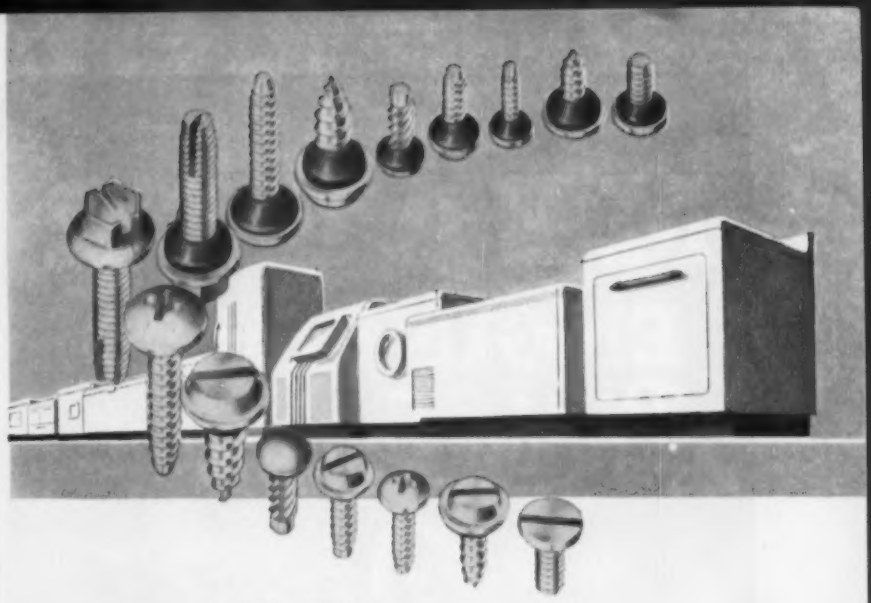
Double-acting reciprocating boosters are illustrated and described in a pamphlet offered by a manufacturer of power - cylinders, boosters, and accumulators. The pamphlet also illustrates a basic circuit, two rapid pressure build-up circuits, two slow pressure build-up circuits, and mounting and dimensional data covering these boosters in 4", 5", 6", 8", 10", 12" and 14" bores in 1" through 5½" diameter rams. *Miller Fluid Power Co.*

For free copy circle No. 9 on postcard, p. 97.

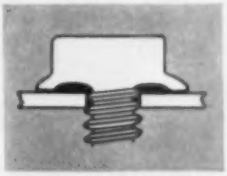
Thermalastic insulation

A 12-page booklet explains the many advantages of Thermalastic (R) insulation. The ten properties of the insulation that extend the life of generators, synchronous condensers, frequency changers, large motors and other heavy rotating equipment in hard service are discussed. *Westinghouse Electric Corp.*

For free copy circle No. 10 on postcard, p. 97.



New Tuff-Tite* Fastener Is Leakproof—Holds Securely —Protects Surfaces



Neoprene washer trapped under head seals hole—acts as cushion.

Tuff-Tite is a new multi-purpose fastener that gives tight, leakproof seating without cracking or chipping porcelain enamel and other fine finishes. It also dampens vibration by acting as a shock absorber and eliminating squeaks and chatter.

All this is accomplished by Tuff-Tite's one-piece metal head and assembled neoprene washer. When tightened, the neoprene is trapped and controlled by an undercut in the washer head. The neoprene is forced into the hole and around the threads to provide a cushion which protects the surface and forms a watertight and airtight seal.

Tuff-Tite fasteners are used for quick, secure, leakproof fastening of metals and plastics. They are available as tapping screws, thread cutting screws, drive screws, machine screws, stove bolts, wood screws and special fasteners. They are made of carbon, alloy and stainless steel, aluminum, brass and other metals in a variety of head styles.

To learn more about how Tuff-Tite can give you leakproof surface protection with economy, use the coupon below.

*Trademark

THE FASTENING AUTHORITY

Townsend

COMPANY • ESTABLISHED 1816

NEW BRIGHTON, PENNSYLVANIA

Sales Offices in Principal Cities

Cherry Rivet Division, Santa Ana, California

TOWNSEND COMPANY
Sales Department
New Brighton, Pa.

Please send to me without obligation "Tuff-Tite" Bulletin TL-97.

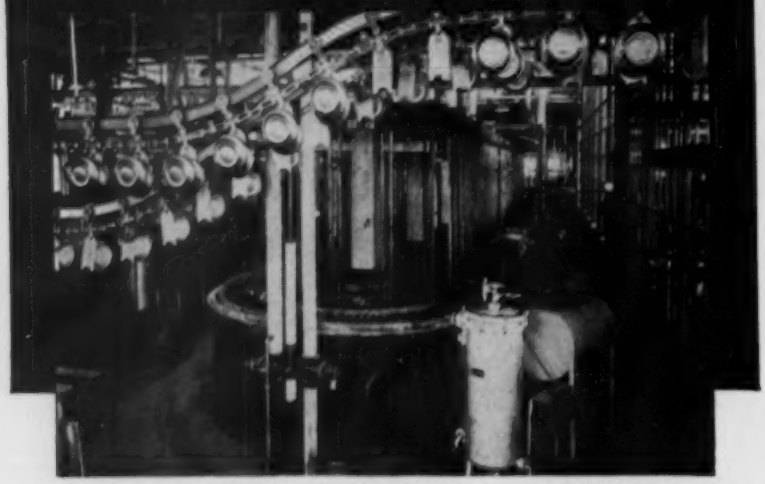
Name_____ Title_____

Company_____

Street_____

City_____ Zone_____ State_____

MEAKER
ENGINEERED
Plating Equipment



DESIGNED FOR HIGHEST EFFICIENCY in YOUR PARTICULAR OPERATION

MEAKER puts engineered efficiency into its line of plating, anodizing, phosphatizing, and other processing equipment. MEAKER engineers will help you determine what specific kind of equipment you need . . . and then see that you get it! Whether you need standard or special, fully automatic or batch type, straight-away or return style, through MEAKER'S recommendations you can be *sure* of getting the ideal installation for your particular process. Many years of experience designing and constructing plating equipment for some of the nation's top industrials has given us the technical ability that assures you the utmost in efficiency—high production plating at low unit cost.

Call or write today and have a MEAKER representative survey your problem with you at no obligation. You may be pleasantly surprised at the results.

MEAKER PRODUCTS

Write, Wire or Phone for Details on How Meaker Service Can Help You Toward Better Plating at Lower Cost.

THE MEAKER COMPANY
1631 SOUTH 55th AVENUE • CHICAGO 50, ILLINOIS
Phone OLympic 2-2110

FREE TECHNICAL LITERATURE

Press rebuilding

A brochure on revitalizing older presses through press rebuilding illustrates and describes the specialized rebuilding facilities and techniques developed by Bliss. In addition, a step-by-step rebuilding process is documented and described to show why the company is able to rebuild a press at a fraction of its original cost and yet give it the same guarantee as a new press. *E. W. Bliss Co.*

For free copy circle No. 11 on postcard, p. 97.

Inputrol

The Inputrol, an automatic input controller for accurately controling input rate of electrical power as well as the flow of liquid or gas to any process in accordance with changes in the measured variable is described. Design flexibility allows the use of either fast or slow rates. *Wheelco Instruments Div., Barber-Colman Co.*

For free copy circle No. 12 on postcard, p. 97.

Nodular iron

Just released is an 8-page product information bulletin on nodular iron for rolls and castings. The bulletin includes: explanation of nodular iron, qualities, specifications of different types, and roll and casting applications. *Aetna-Standard Engineering Co.*

For free copy circle No. 13 on postcard, p. 97.

Balancing machines

The latest catalog from one of the world's leading builders of industrial balancing machines is available. The subject is the improved line of type S Dynetric balancing machines. The new bench type and vertical type machines are included, with ⅓ of the book devoted to accessories and applications. *Gisholt Machine Co.*

For free copy circle No. 14 on postcard, p. 97.

Job study report

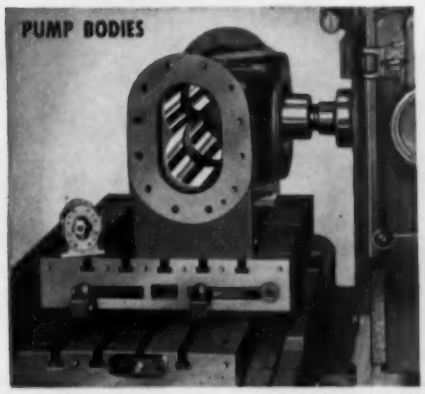
A report shows the advantages of the Towmotor fork lift truck in the case of a plant which produces cast bars, tubes and shapes. Operating seven days a week, the lone lift truck handled over 50-million lb of charges in seven years. *Towmotor Corp.*

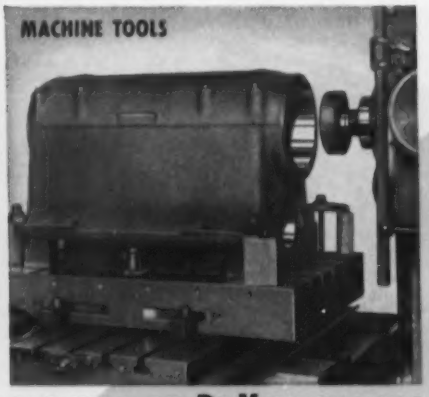
For free copy circle No. 15 on postcard, p. 97.

The De Vlieg System of

*JIGLESS PRODUCTION

...eliminates expensive boring jigs!





TYPICAL EXAMPLES OF JIGLESS PRODUCTION ON DE VLIEG JIGMILS

The JIGMIL Technique:

- ELIMINATES SPECIAL BORING JIGS
- REDUCES MACHINING TIMES
- PERMITS USE OF SIMPLIFIED TOOLING
- IMPROVES ACCURACY WITH RESULTANT CUT IN ASSEMBLY COSTS

The De Vlieg System of Jigless Production permits complete flexibility of product design!

If your shop is burdened with costly boring jigs and special tooling, it will pay you to investigate the

DE VLIEG *SPIRAMATIC* JIGMIL

**Come to Detroit—*

see a practical demonstration of the JIGMIL TECHNIQUE

Write for comprehensive illustrated Catalog

DE VLIEG MACHINE COMPANY • 450 Fair Ave., Ferndale • Detroit 20, Mich.

Externally Upset OSTUCO Tubing

saves 31% on processing improves mandrel life

for Halliburton Oil Well Cementing Company

A savings of 31% over previous manufacturing methods, was made possible by using externally upset OSTUCO Tubing as Wall Packer Mandrels in "Howco" Expanding Shoe Assemblies. These OSTUCO forgings eliminated a welding operation and reduced machining time and cost. One-piece fabrication greatly improved the useful life of the part.

Compare your tubing costs with job-designed OSTUCO Tubing. *Special-quality* OSTUCO Tubing is manufactured to your individual requirements . . . formed to save processing time and waste. Fill all your tubing requirements on *one* order with OSTUCO'S unique *single-source* service. You'll eliminate interplant shipment, reduce error and speed delivery. Wire, write or phone OSTUCO for complete details, or submit blueprints for immediate quotation.

OSTUCO SHELBY OHIO

OSTUCO TUBING

SEAMLESS AND ELECTRIC WELDED STEEL TUBING
—Fabricating and Forging

OHIO SEAMLESS TUBE DIVISION
of Copperweld Steel Company • **SHELBY, OHIO**
Birthplace of the Seamless Steel Tube Industry in America
SALES OFFICES: BIRMINGHAM • CHARLOTTE • CHICAGO (Oak Park) • CLEVELAND • DAYTON • DENVER • DETROIT (Ferndale) • HOUSTON • LOS ANGELES (Beverly Hills) LOUISVILLE • MOLINE • NEW YORK • NORTH KANSAS CITY PHILADELPHIA • PITTSBURGH • RICHMOND • ROCHESTER ST. LOUIS • ST. PAUL • SEATTLE • TULSA • WICHITA
CANADA, RAILWAY & POWER ENGR. CORP., LTD.
EXPORT: COPPERWELD STEEL INTERNATIONAL COMPANY
117 Liberty Street, New York 6, New York

FREE TECHNICAL LITERATURE

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

This section starts on p. 92

Explosion-proof motors

"All new—improved all the way through," a completely new series of U. S. totally-enclosed and explosion-proof motors are detailed in a bulletin. Designated as Types J and E, these motors are an advanced concept of complete protection against atmospheric hazards. These new motors are engineered for operation where dangerous fumes, dusts, combustible materials and moisture are prevalent. Photos and drawings illustrate such features as the pre-wound stator core, asbestos-protected windings and Lubriflush lubrication. *U. S. Electrical Motors, Inc.*

For free copy circle No. 16 on postcard, p. 97.

Drill jig bushings

A bulletin gives list prices of American drill bushings (unground O. D.'s). Three types of bushings are covered: headless press fit, liners for SR and FR bushings, and head press fit. The bulletin is illustrated. It contains brief data on the subject of "head press fit-heads." *American Drill Bushing Co.*

For free copy circle No. 17 on postcard, p. 97.

Saw blades

Data and specifications for Wagner segmental saw blades are contained in a 4-page brochure. Also illustrated is the Wagner saw blade sharpening machine. The many special features are listed, such as the extra deep rim of the parent blade, which ensures extra high stability; and the tapered segments, which reduce cutting friction. *Klingelhofer Machine Tool Co.*

For free copy circle No. 18 on postcard, p. 97.

Over 275 machines

More than 70 different types of automatic dieing machines and precision power presses are included in a new 40-page illustrated catalog. The booklet, which describes more than 275 machines produced by the company's four divisions, is 8½ x 11 in. and specially bound to permit easy removal and replacement of pages. Detachable business reply cards for each of the divisions form part of the booklet's front cover. *Emhart Manufacturing Co.*

For free copy circle No. 19 on postcard, p. 97.

Microdot

How to use the world's smallest, lightest coax is the subject of a new four-page illustrated folder. Microdot circuitry advantages are listed: for example, versatility—Microdot is the world's only complete line of Microminiature coax cables and connectors . . . 50, 70 and 93 ohms. *Microdot Div., The Felts Corp.*

For free copy circle No. 20 on postcard, p. 97.

Tooling resins

An interesting booklet has been issued concerning the job of providing customers with first rate, quality controlled plastic tooling resins ready to do the job in that tooling requirement for which they were compounded (aircraft tooling, automotive tooling, commercial tooling, foundry patterns). The company strives to improve existing formulations and create new ones, and also serves firms seeking to adapt modern plastics materials to their applications. *Furane Plastics, Inc.*

For free copy circle No. 21 on postcard, p. 97.

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. **6/9/55**

Circle numbers for Free Technical Literature or Information on New Equipment:

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60

If you want more details on products advertised in this issue fill in below:

Page.....Product.....

Page.....Product.....

Page.....Product.....

Your Name .....

Title .....

Company .....

Co. Address .....

City ..... Zone .....

State .....

FIRST CLASS
PERMIT No. 36
(Sec. 34.9 P.L.&R.)
New York, N. Y.

BUSINESS REPLY CARD
No postage necessary if mailed in the United States

POSTAGE WILL BE PAID BY

THE IRON AGE
Post Office Box 77
Village Station
NEW YORK 14, N. Y.

Mechanical seals

A new type BJ mechanical seal for high pressure boiler feed pumps which stops liquid loss, reduces heat loss and requires no operating adjustment, is announced. These BJ seals are in operation in high pressure, hot water pumping operations including temperatures up to 430°F. The company makes a full line of mechanical seals for centrifugal pumps including special seals for chemical, volatile liquid, abrasive and high temperature problems. As far as is known, this is the first successful application of a mechanical seal to large high pressure, high temperature power pumps. *Mechanical Seal Section, Byron Jackson Co.*

For free copy circle No. 22 on postcard, p. 97.

Grinding equipment

The precision tool grinding equipment described in a folder includes: the universal tool and cutter grinder, the heavy duty Ace, the 20" template (controlled) tool bit grinder, the "Arc" face mill grinder, etc. The booklet is fully illustrated, and contains specifications. *Oliver Instrument Co.*

For free copy circle No. 23 on postcard, p. 97.

Jet plater

Small volume plating facilities find increasing satisfaction in using the complete, compact, portable, automatic Sel-Rex Jet Plater, described in a booklet. Designed and built by precious metal plating experts, the Jet is ideal for use with any precious metals plating solution, small volume acid, or alkaline solutions, conventional or "bright." *Sel-Rex Precious Metals, Inc.*

For free copy circle No. 24 on postcard, p. 97.

Sheet handlers

Sheet handlers for economical, safe, efficient storage of sheet material are described and illustrated. The sheet handler can be used to store many materials, including steel, glass, aluminum, formica, monel, fiber, hard rubber sheet. It is also flexible, and can be used portably or installed permanently. *Western Manufacturing Co., Inc.*

For free copy circle No. 25 on postcard, p. 97.

FOR MORE LITERATURE
Many companies offer free literature and other information in their advertisements. For the names of these firms see the company listings in the index of advertisers.

Solderless wiring

The manufacturers of solderless wiring devices have just released a new booklet dealing with the growth of the solderless wiring industry and A-MP's development of techniques and tooling to meet the specific requirements of the aircraft, appliance, power, electronics and transportation industries. The 28-page booklet also tells of the philosophies and operating procedures of a business which has expanded 15 times its original size in the 13 years it has been in business. *Aircraft-Marine Products.*

For free copy circle No. 26 on postcard, p. 97.

Vac-u-lift

The exclusive features of Vac-u-lift for materials handling are described in an illustrated folder. It is designed to lift heavy objects without the customary prying from the floor or stock pile—no more pry bars, chains and blocks. Units can be built to your specifications for special usages and weights. *Blakeslee Mfg. Co., Associate of International Staple and Machine Co.*

For free copy circle No. 27 on postcard, p. 97.

Wire and cable

Silicone rubber-insulated high-temperature wires and cables are described. The booklet covers listings and specification data on power cable, control cable, appliance and fixture wires, apparatus leads, heating cable, defroster wire, aircraft wire, shipboard cable, and generator leads. General information is given on the physical properties of silicone cable. Comparative values of these cables in relation to organic rubber-insulated cables are shown in graph form. *Wire and Cable Dept., General Electric Co.*

For free copy circle No. 28 on postcard, p. 97.

BUSINESS REPLY CARD
No postage necessary if mailed in the United States

POSTAGE WILL BE PAID BY

THE IRON AGE
Post Office Box 77
Village Station
NEW YORK 14, N. Y.

FIRST CLASS PERMIT No. 36 (Sec. 34.9 P.L.&R.) New York, N. Y.

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. **6/9/55**

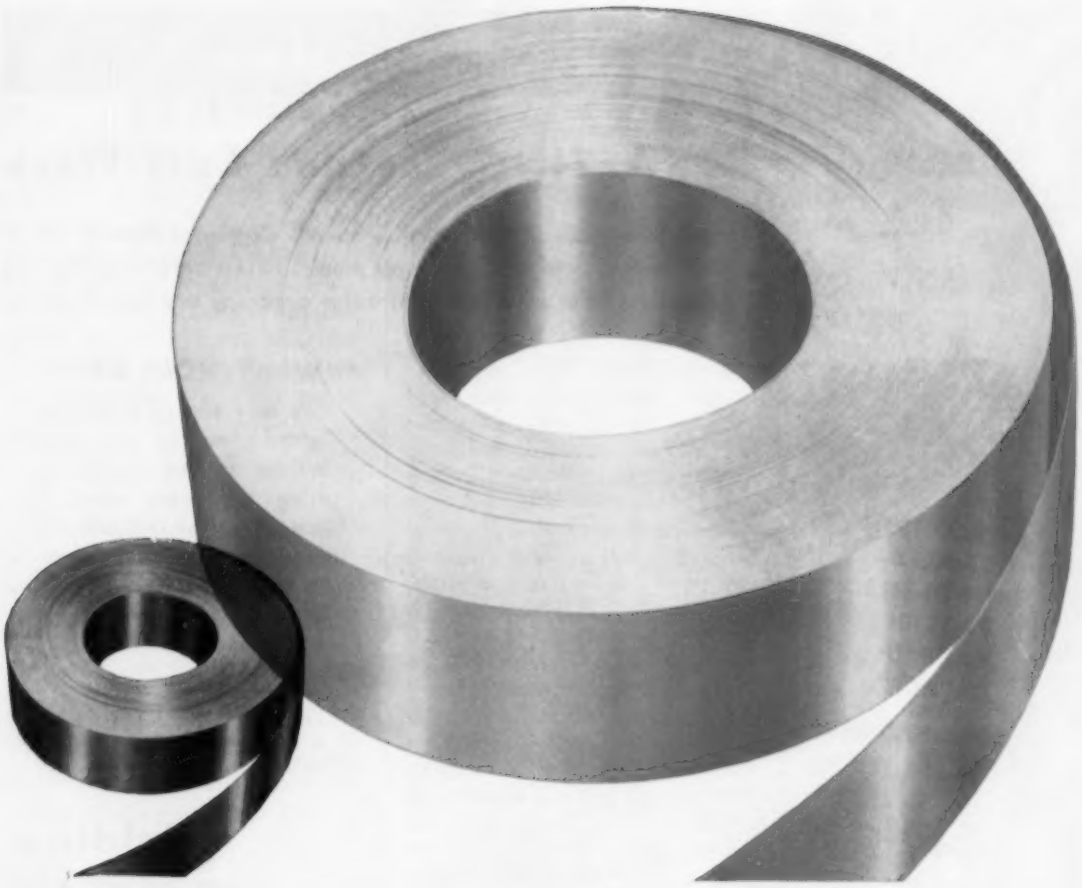
Circle numbers for Free Technical Literature or Information on New Equipment:

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60

If you want more details on products advertised in this issue fill in below:

Page..... Product.....
Page..... Product.....
Page..... Product.....

Your Name
Title
Company
Co. Address
City Zone
State



Brainard triples electro-galvanized steel capacity to give you faster service

● A new Brainard plant triples capacity for electro-galvanized steel . . . assures you fast service on standard or special orders. Brainard's fully integrated operation, from ore to finished products, gives you a dependable source of supply at all times.

Brainard electro-galvanized steel has a built-in finish . . . plating and finishing costs are eliminated. Coating provides permanent protection against rust and corrosion. Coating thickness can be supplied as specified.

Brainard
SHARONSTEEL
STEEL DIVISION
SHARON STEEL CORPORATION

Find out how Brainard's new facilities assure you a dependable source of supply. Send coupon for free booklet.

BRAINARD STEEL DIVISION
Dept. O-6, Griswold Street, Warren, Ohio

Please send free descriptive booklet on Brainard electro-galvanized steel.

Name_____

Position_____

Company_____

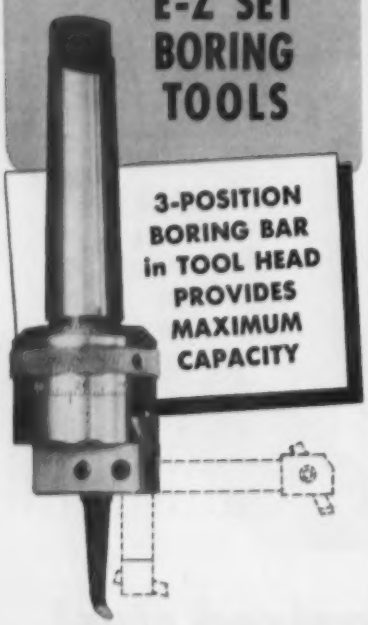
Street_____

City_____ State_____

COMPLETE STRAPPING SYSTEMS & MATERIALS • WELDED STEEL TUBING • ELECTRO-GALVANIZED STEEL • SCAFFOLDING • PALLET RACKS • BUILDING PRODUCTS

Offices in principal cities throughout the U. S.

YOU CAN SET CUTS *in 1/10 time* with MAXWELL-MADE E-Z SET BORING TOOLS



Maxwell E-Z Set Boring Tools can be set for cuts in approximately 1/10th the time formerly required by similar tools! This is made possible by precision calibrations on the micrometer-like dial, which also provides boring accuracy to within 0.0002-inch.

Maximum safety of operation and ease of handling is assured by smooth circular shape. Interchangeable shanks facilitate use of E-Z Set Boring Tools in turret lathe, jig bore, milling machine, boring mill, automatic or other machine tools. Three models are available having maximum boring bar capacities of ½, 1 and 1½ inches, and covering a boring range from ⅛ to 20 inches.

Specify Maxwell E-Z Set Boring Tools for accurate, high speed production boring.

WRITE TODAY FOR E-Z SET BORING TOOL CATALOG

389B-MC

THE MAXWELL COMPANY

BEDFORD, OHIO

DRAFTING: Method Cuts Work

Major savings in drafting time have been gained through use of a photo-mechanical method at one plant . . . Intricate drawings are made in minutes with greater accuracy and less checking.

A reduction of more than 95 pct in time needed to produce engineering drawings has been achieved here by the General Electric Co.'s Medium Voltage Switchgear Dept. New and ingenious techniques in the use of photo-mechanical materials and processes now permit making in a matter of minutes a tracing which formerly took 6 to 18 hours.

Speedy methods were needed because the department annually supplies many thousands of copies from thousands of drawings of equipment shipped to purchasers. Theoretically billions of different arrangements of components are possible and conventional preparation of drawings and tracings is too slow.

Film Overlays Reusable

In applying the new methods it is merely necessary for the engineer or draftsman to prepare a simple coded order to the Blueprint Section.

This order embodies all necessary instructions for the preparation by a clerk of a composite positive film transparency, comprising reusable positive film overlays, from which a translucent auto-positive is printed by conventional photo-mechanical methods.

Has Many Advantages

The auto-positive, which thus becomes the original tracing, has many advantages. It is tougher than conventional tracing paper and can stand rough handling. It has sharper contrast with dense, crisp, black lines which permit high printing speeds. Erasures can be made quickly and easily by moistening the image and using a soft eraser.

A major advantage is greater drafting accuracy with a saving in time of skilled engineers and draftsmen, due to the elimination of a substantial amount of detailed sketching and checking.

WANT MORE DATA?

You may secure additional information on any item briefed in this section by using the reply card on page 97. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

Welding:

Convenient mobile unit simplifies maintenance.

Moving a self-sufficient welding unit from one job to another may be accomplished with the speed of a pickup truck with the jeep-powered mobile welder made by A. J. Parsons, Washington, Pa.

The unit consists of a Lincoln 200 or 300 amp generator with a large built-in exciter generator mounted on a Willys 4-wheel drive jeep or truck. Power for the welder and generator is supplied by the truck engine by means of a belted power take-off system.

Good Maintenance Rig

Aside from the power equipment, brackets for acetylene and oxygen tanks, plus boxes for storage of tools and equipment, are built into the units. Ample room is provided for tools, racks and supplies, and a front mounted winch may be installed to provide a means of raising, lowering, or pulling loads in rugged places where other power is not available.

TECHNICAL BRIEFS

Fastening:

Device feeds screws to power drivers.

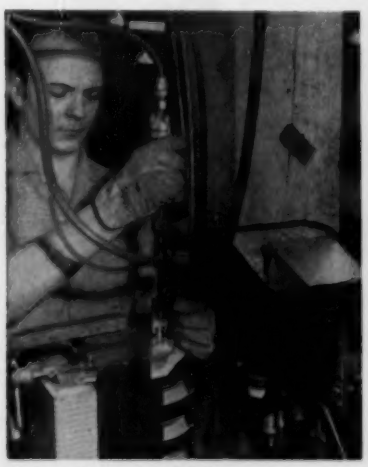
The problem of feeding screws to power screw drivers has been simplified with a device which is reported to substantially speed up screw fastening operations. The air-powered Pneuma-Serve also permits automation of screw assembly operations.

Up to now a bottleneck in all screw-using mass production industries, the job of feeding screws to power screwdrivers has proved a problem for designers and engineers. The feeding device, which offers a solution to these problems, is being produced by Pneuma-Serve, Inc., of Cleveland.

Speeds Screw Assembly

In automotive, electrical appliance and heater-air conditioner plants where automated Pneuma-Serve screw feeding has been tested, the speed of screw fastening operations has been stepped up anywhere from 50 to 400 pct.

Screws are automatically and almost instantaneously fed from a hopper to a unique head that fits virtually any standard power screwdriver. Although basically designed to augment existing hand-operated power equipment, the feeding device is equally adaptable to complete automation. In either case, hand-placing of



Speeds assembly . . .

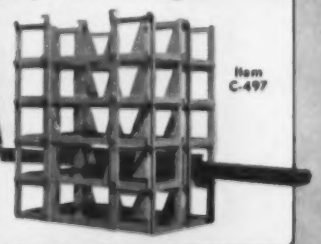
CONSULT FOR THE BEST

P-S PORTABLE *Heavy Duty* BAR RACKS

Any rack easily accessible by one-man operated overhead crane with automatic double tong for quick pick-up and easy carrying.

ANY RACK EASILY ACCESSIBLE

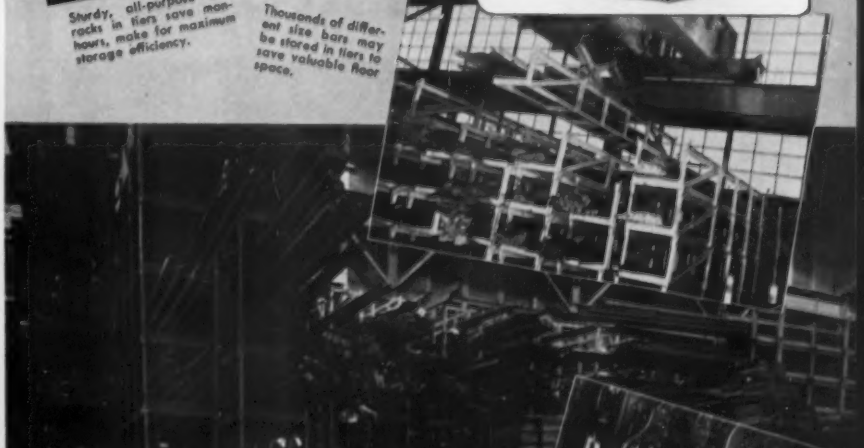
Tier and store steel shapes the simple, safe, space-saving way. No rack selection problem using overhead crane. Design-adapted for easy selection from racks without disturbing tiers. Custom-built for any capacity and stock length.



Item C-497

Sturdy, all-purpose bar racks in tiers save man-hours, make for maximum storage efficiency.

Thousands of different size bars may be stored in tiers to save valuable floor space.



Efficient use of floor space makes necessary rack tiers for various capacities and bar lengths.

Bars brought in racks direct to machines, ready for finishing operations.

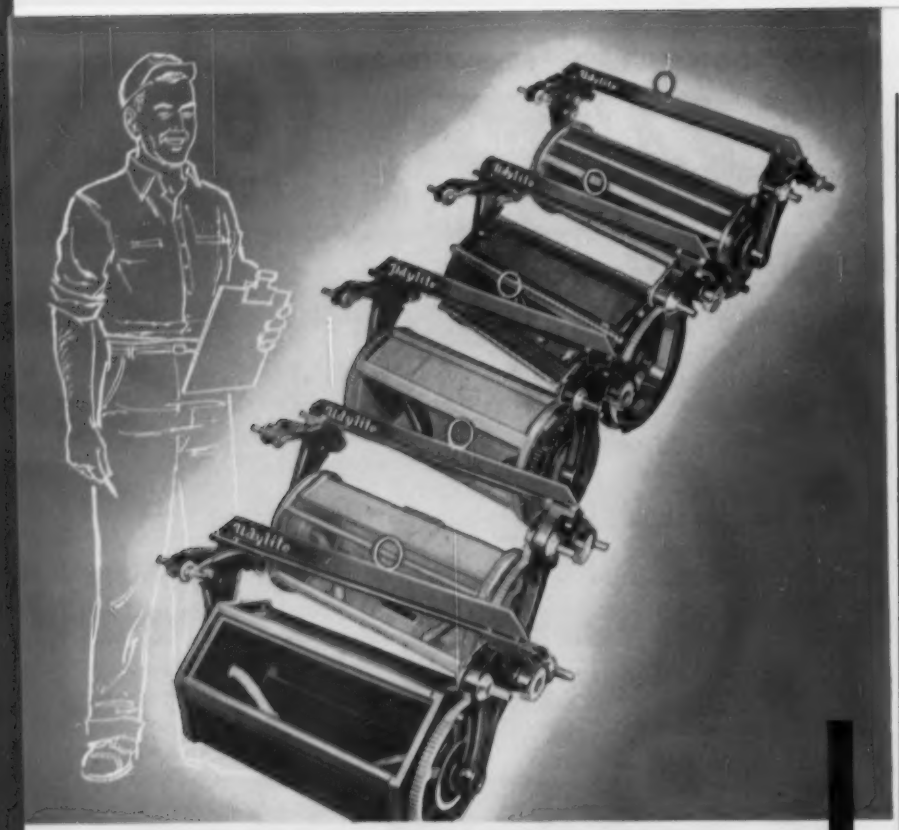
DESIGNED AND MANUFACTURED BY

When Ordering Always give "item" number; this will help prevent error. Write for catalog

Palmer-Shile Co.

16005 FULLERTON AVE., DETROIT 27, MICH.

550 Fifth Ave., New York 36, N. Y. Plaza 7-8774 • 612 N. Michigan Ave., Chicago 11, Ill. Michigan 2-7407
857 Leader Bldg., Cleveland 14, Ohio. Superior 1-3235 • 835 N. Capital Ave., Indianapolis, Ind. Melrose 5-2587
1209 Burlingame, Burlingame, Calif. Diamond 2-0823 • 6440 Fleet St., Los Angeles, Calif. Raymond 3-3733



ALWAYS DEPENDABLE

When you buy Udylite barrel plating cylinders you get more than good materials—you get the experienced engineering that has made Udylite barrels the best built, longest lasting, most economical barrels on the market. For Udylite barrels are constructed with the characteristics of the materials well in mind—and engineered accordingly.

Along with fine engineering Udylite is in continuous search for materials giving longer life and greater over-all economies in barrel plating. Udylite manufactures barrels of Rubber, Bakelite, Melamine, Lucite and now in turn has developed Tempron Hard Rubber.

Tempron Hard Rubber is recommended as the best plating barrel cylinder material now available, but its characteristics require special construction. Udylite's new construction (patent pending) features interlocking panels and ribs with the added advantage that panels, ribs, rails and cylinder heads are individually replaceable.

Tempron Hard Rubber has greater abrasion resistance, will handle more cleaning and plating solutions at higher temperatures including hot Stannate Tin, and with Udylite's new construction, will take the hard pounding of heavier loads day after day.

It will pay you to investigate Tempron Hard Rubber cylinders. Fill out the coupon below and mail today.

WORLD'S LARGEST PLATING SUPPLIER

We would like to discuss Tempron Hard Rubber cylinders with your sales representative. Please have him call.

NAME

COMPANY

STREET ZONE

CITY STATE

THE Udylite CORPORATION
DETROIT 11, MICHIGAN

Screws pass from hopper through plastic hose . . .

fasteners, which accounts for a large portion of the operator's time, can be eliminated.

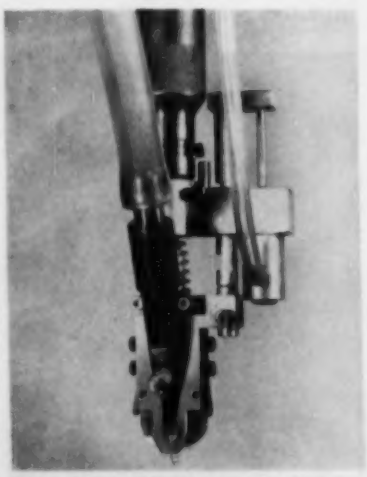
Hopper to Driver

Using the Pneuma-Serve, screws pass from a hopper, holding enough screws for 5 to 8 hours' work, through a plastic hose to a special head mounted on a power screwdriver.

The head grips screws in such a way that they may be driven at any angle, in any plane. After one screw has been driven, the next is automatically fed and instantly positioned.

The operator may take the driver and head assembly to work stations as far as 20 ft from the hopper. If the driver is set up to operate automatically, completely "automated" screw fastening may be achieved, up, down or sideways.

A large variety of types and sizes of screws, up to ¼-in. in diam and up to 1¼ in. in length, may be handled. The machine will accommodate virtually any head style, including bolts or screws with washer attached, self-tapping screws, sheet metal screws, machine screws and wood screws. The device can be used with practically any standard power screwdriver.



Automated screw feeder...

HYDRAULIC DANGER ZONE

Ordinary hydraulic fluid, escaping under pressure, can start a fire 40 ft. or more from a broken line! Is your plant safe? Here's how one firm protects men and machines inside the danger zone . . .

THE SPANG-CHALFANT PLANT of THE NATIONAL SUPPLY CO. switched to fire-resistant Pydraul F-9 hydraulic fluid after a line break involving flammable fluid caused a furnace shutdown, damaged electrical connections and lost 6 hours' production time. The plant operates this Hagan Rotary furnace continuously while a hydraulic boom containing 800 gallons of Pydraul moves white-hot billets in and out of 2250°F. heat. Recently, Pydraul's safety was proved when a ruptured hose sprayed fluid over hot billets and furnace. Result: No damage, no injuries and no time lost! *Pydraul: Reg. U. S. Pat. Off.*

PROOF OF PYDRAUL SAFETY

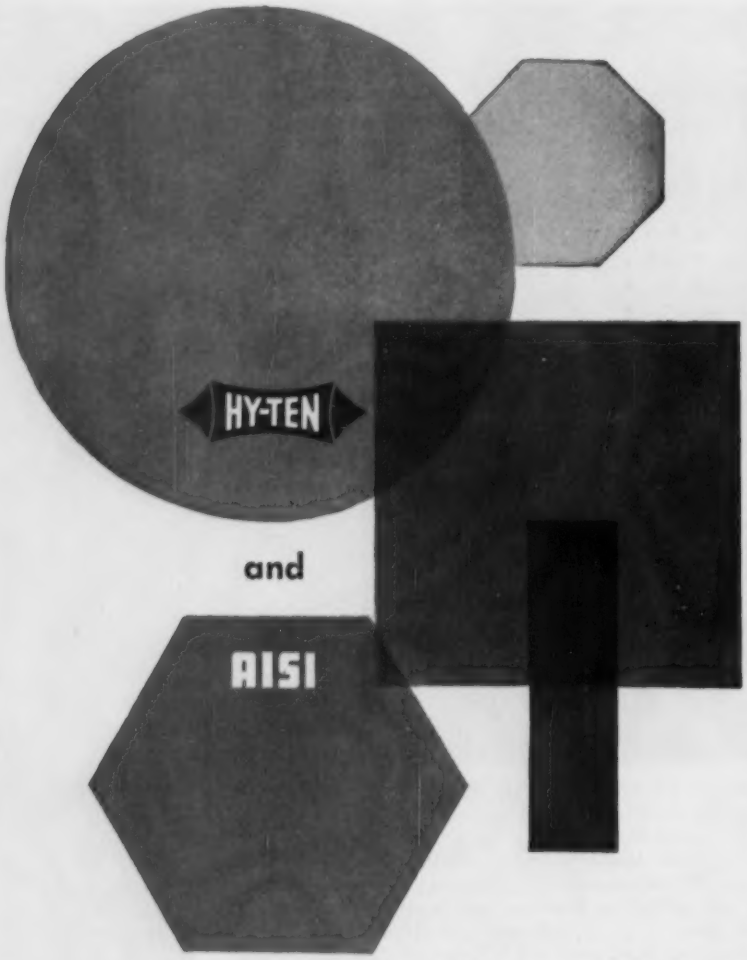
In photo at left, ordinary hydraulic fluid sprayed into oxyacetylene torch burns explosively. At right, Pydraul does not!

FREE! New 19-page technical booklet, "PYDRAUL F-9," gives facts on Pydraul tests, advantages, properties, uses and installation. Mail coupon to: Organic Chemicals Division, MONSANTO CHEMICAL COMPANY, Box 478-Q-5, St. Louis 1, Mo.

MONSANTO
CHEMICALS – PLASTICS

SERVING INDUSTRY, WHICH SERVES MANKIND

DETROIT 11, MICHIGAN



bars, billets and forgings
in sizes, shapes and treatments for every need!

Wheelock, Lovejoy & Company, Inc., can fill your alloy steel requirements promptly. This applies to both standard AISI and SAE steels and to our own HY-TEN steels—"the standard steels of tomorrow". Take advantage of our seven strategically located warehouses. All of them can supply these steels in the form and quantity you need. Every warehouse, too, is staffed with expert metallurgists who are ready to serve you.

Write today for your FREE copies of Wheelock, Lovejoy Data Sheets. They contain complete technical information on grades, applications, physical properties, tests, heat treating, etc.

near you . . .

Warehouse Service—Cambridge • Cleveland • Chicago
Hillside, N. J. • Detroit • Buffalo • Cincinnati
In Canada—Sanderson-Newbould, Ltd., Montreal and Toronto

WHEELOCK, LOVEJOY & COMPANY, INC.
126 Sidney Street, Cambridge 39, Mass.

Copying:

Spark gap tracer solves machining problem.

A machine tool copying tracer, based on constancy of voltage across a spark gap, has solved one of the oldest problems in tracer controls—how to prevent the tracer stylus from exerting force on the model.

The spark gap tracer was described by E. E. Kirkham, project engineer, Pratt & Whitney Div., Niles - Bement - Pond Co., West Hartford, Conn., at the recent Machine Tool Electrification Forum sponsored by Westinghouse Electric Corp., at Buffalo, N. Y. The spark gap transducer was invented by P. J. Campbell of New England Tool Co.

Never Touches Model

Stylus of the new tracer control never touches the model. It traces by maintaining a constant spark gap between the model and the stylus.

The result is a simple tracer control which exerts zero operating force on the model, which has a very high speed of response and a large output signal, and which has inherent flexibility.

The tracer may be applied to machines used in making forging and diecasting dies, and in producing molds and forces for the plastics industry. It is particularly suitable for the duplication of intricate impressions from plaster or plastic models.

Shape of the Stylus

The stylus of the tracer is made to have the same shape as the surface of revolution generated by the revolving cutter. The model is moved to and fro under the stylus and clutches maintain a constant relation between the stylus and the model.

The spark gap tracer uses a minute electric spark between the stylus and the conductive model as a transducer. The longer the gap between stylus and model, the higher will be the voltage between them.

The relation between the spark

STRONGER, SAFER, STREAMLINED CONSTRUCTION

...with Phillips Cross-Recessed-Head Screws

"ASSEMBLY IMPROVED IMMEDIATELY when we began using Phillips screws," relates the assistant purchasing agent of Fasco Industries, Rochester, N. Y., leading makers of shaded pole motors, blowers, fans and ventilators. "Now we can use mechanical drivers that save plenty of time. Burring seldom happens any more. Product appearance couldn't be better. Whether inside for extra sturdiness, or outside for extra dressiness, we use Phillips screws almost exclusively!"

MORALE AND PRODUCTION SOARED with changeover to Phillips screws, which now comprise more than 92% of all screws used at Yankee Metal Products Corporation, Norwalk, Conn. Makers of auto lamps, mirrors and safety equipment since 1915, Yankee depends on many types of Phillips heads — both unplated and chromed to match accessories. Yankee's Merchandising Director says happily, "Phillips screws for extra safety, speed and ease of use really build plant morale and incentive earnings!"

EXTREME ANGLES NO PROBLEM where tightness is vital as in this fan assembly built by leading small motors manufacturer A. C. Gilbert of New Haven, Conn., to withstand lifelong vibration. Single-slot screws proved treacherous and expensive in time and damage loss. An executive engineer for Gilbert says, "Using Phillips screws for over 10 years, we have learned that, for all around production efficiency, Phillips are the best."

MANUFACTURERS OF PHILLIPS CROSS-RECESSED-HEAD SCREWS

THE FASTENERS OF TODAY
...AND OF THE FUTURE

X marks the spot

... the mark of extra quality

Allmetal Screw Products Company, Inc. • American Screw Company • Atlantic Screw Works, Inc. • The Blake & Johnson Co. • Central Screw Company • Continental Screw Company • The Eagle Lock Company • Elco Tool and Screw Corporation • Great Lakes Screw Corporation • The H. M. Harper Co. • The Lamson & Sessions Company National Lock Company • The National Screw & Manufacturing Co. • Parker-Kalon Div. General American Transportation Corporation • Pheoll Manufacturing Company Rockford Screw Products Company • Scovill Manufacturing Company • Shakeproof Division Illinois Tool Works • The Southington Hardware Manufacturing Company Sterling Bolt Company • Universal Screw Company • Wales-Beech Corporation

gap length, L, and spark gap voltage, E, can be expressed by the empirical formula, $E = 300 + 100L$. Spark gap length is measured in thousandths of an inch.

The circuit used to produce the spark and to obtain a useful error signal is relatively simple. A large value of resistance in series with the stylus limits the current so that the spark is nearly invisible and is not destructive to the stylus and model.

This current is also low enough that no harm comes to persons who touch the stylus. The 0.5 megohm resistor in series with the stylus isolates the lead wire capacitance from that of the spark gap itself, thus reducing the magnitude of oscillations which can exist within the arc.

Surfaces of nonconducting models must be painted with a conductive coating before they can be used in a machine employing a spark gap tracer. Complete coverage and continuity of the coating is necessary, but moderately high resistance has no effect; therefore, a very thin coating is permissible, producing negligible change in the contour of the model.

When desired, several spark gaps may be connected in parallel to advantage. For example, the depth stop used on a machine consists simply of an additional electrode attached to the upper end of the tracer spindle. The spark will be formed at the model or on the depth stop, whichever is higher.

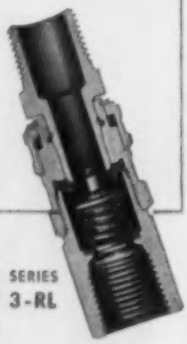
Maximum depth of cut may be set by rotating the depth stop micrometer screw, seen below the depth stop. The cutter spindle can be raised or lowered relative to the tracer stylus using a micrometer. The depth of cut in the work piece may be accurately set.

Faired Curve Produced

The value of this zero force transducer for duplicating from soft models has already been indicated. In another application, the transducer can be employed to trace a thin strip to shim stock passing through several known points. Thus, a faired curve through these points can be produced.

A machine marketed by the Pratt & Whitney Div. uses this principle in production of airfoil shapes in compressor blades.

Everything You Want
in a Quick-Connective Pneumatic Coupling



HANSEN SERIES 3-RL
RING-LOCK COUPLING

On any job requiring ¾" to ⅛" connections—from the air line to the air tool—this single size Hansen Ring-Lock Coupling—with completely interchangeable Sockets and Plugs—does it all—makes it easy to keep stock of parts in balance—holds inventories to a minimum.

To connect, you merely push the Plug into Socket. To disconnect, just turn the sleeve. When Coupling is connected, a locking ring in Socket enters groove in Plug, provides positive lock and insures tight fit. Sockets with aluminum bodies are available for use with small hand-operated air tools.

- Smaller.
- Lighter.
- Effectively handles more volume than any other coupling of equal dimensions.
- Handles any job with fittings from ¾" to ⅛", from the air line to the air tool.
- All Series 3-RL Sockets and Plugs are interchangeable—reduces stock inventory to a minimum.
- One-way shut-off—for pneumatic service applications.
- Positive locking.
- Equipped with automatic sleeve lock.

Write for Descriptive Literature

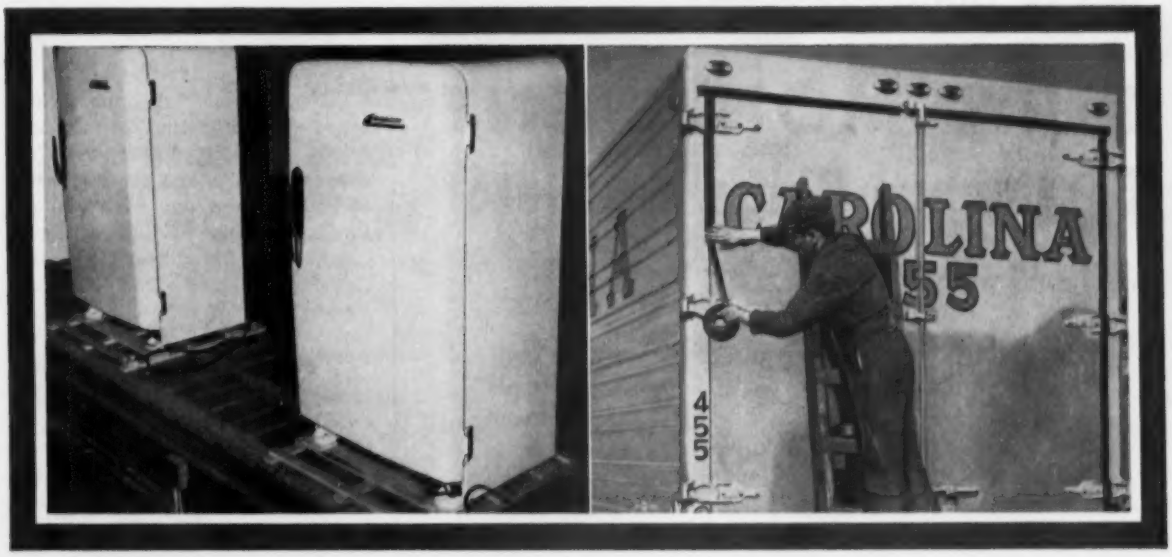
SINCE 1915 — QUICK CONNECTIVE FLUID LINE COUPLINGS
THE HANSEN MANUFACTURING COMPANY
4031 WEST 150th STREET • CLEVELAND 11, OHIO

THIS 120,000-LB cast steel Francis runner being checked in Allis-Chalmers shops is for the seventh 57,500-hp, 112-ft head, 85.7-rpm hydraulic turbine for Fort Randall Dam near Pickstown, S. D.

Polyken

CONTROLLED STRENGTH TAPES

SEAL FREEZERS FOREVER OR CARGOES FOR MILES



Polyken Tapes do pretty much the same job in both the applications shown above. In the freezer cabinets, *Polyken* is put on over the inside metal seams. The seal has to be tight and permanent. A leak will cause condensation damage to the insulation.

There can't be any cracks in those trailer doors either. The suction at the rear of a moving truck is so great that rain and snow will penetrate even the smallest cracks and cause damage to the cargo. Here the *Polyken* Tape forms a seal that stands up under weather and vibration from the start to the end of the trip. Then it pulls off easily.

Polyken Tape seals out moisture in both cases . . . but the conditions are different and so are the requirements. That's why the *Polyken* Tape used in the freezer cabinets is not the same *Polyken* Tape used on the trailer doors. To meet the requirements of specific jobs, *Polyken* Tapes have *controlled strength*—the controlled combination of adhesive and backing. Use the controlled strength for your job—do it right—at the lowest possible cost—and save.

The coupon will bring you complete information.

Polyken®

INDUSTRIAL TAPES

Polyken Products Department of The Kendall Company

Polyken, Dept. IA-F
222 West Adams St., Chicago 6, Illinois

Please send me physical properties and further information on *Polyken* Controlled Strength Tapes.

Name_____ Title_____

Company_____

Street Address_____

City_____ Zone____ State____

2632 feet of BURT MONOVENT comfort-conditions this modern forging plant.

FOR ECONOMICAL VENTILATION IN HEAVY INDUSTRY

BURT MONOVENT
Continuous Ridge Ventilator Is Your *BEST* Buy!

Where high heat or fumes require the removal of large volumes of air, Burt Monovent exhausts more air per dollar than any other ventilator. It provides uniform ventilation of the entire structure— in effect, converts the roof ridge to a quick-acting giant air valve. The Monovent is economical to install, operate and maintain and highly efficient.

- INSTALLS ON ANY TYPE ROOF
- SIZES FROM 4" TO 96"
- STURDY CONSTRUCTION FOR LONG LIFE
- MINIMUM MAINTENANCE

Send for FREE *Data Book!*

Write for Burt Data Book SPV-101-D. It supplies quick data on Burt's complete line of modern Roof Ventilators.

FAN & GRAVITY VENTILATORS • LOUVERS • SHEET METAL SPECIALTIES

The Burt Manufacturing Company

920 So. High St. Akron II, Ohio

MEMBER POWER FAN MANUFACTURERS ASSOCIATION

New Films:

"William Johnson and the Draggin." 16 mm, color, sound. Running time 13 minutes. Designed to stimulate interest in effective machine replacement programs. Cincinnati Milling Machine Co., Cincinnati 9.

"A New Approach to Copy Turning," 16 mm, color, sound. Running time 28 minutes. Presents a completely new approach to the problem of doing contour copying whether it be shafts, bores or face contours. The New Britain Machine Co., New Britain-Gridley Machine Div., South and East Sts., New Britain, Conn.

"Fiery Magic." 16 mm, color, sound. Running time 23 minutes. Shows steps in manufacture of calcium carbide, and portrays uses of acetylene—from early lamps through modern welding. National Carbide Co., Div. of Air Reduction Co., Inc., 60 East 42nd St., New York 17.

"Accent on Accuracy," 16 mm, color, sound. Running time 28 minutes. Shows how accuracy is built into jig borers, and the many steps required to assure years of operating accuracy in these important machine tools. *Pratt & Whitney Div., Niles-Bement-Pond Co., West Hartford 1, Conn.*

"Jiffy," a test film for rapid checking and demonstrating of 16 mm projector system performance. Running time 4 minutes. Provides checks for picture steadiness, uniform picture brightness, flutter, sound track adjustment, sound. Society of Motion Picture and Television Engineers, 55 West 42nd St., New York 36. $10.50.

"In the Chips," 16 mm, sound, color. Running time 24 minutes. Gives a graphic insight as to what happens during machining of free-cutting brass rod; how proper alloying of the rod can improve tool life. Chase Brass & Copper Co., Inc., 236 Grand St., Waterbury, Conn.

Can we be useful to you?

RELIANCE STEEL

DIV. DETROIT STEEL CORPORATION

Processing and Distributing Plants

CLEVELAND PLANT, CLEVELAND 27, O. . VUlcan 3-3600
DETROIT PLANT, DETROIT 28, MICH. . . WEbster 3-5866
EASTERN PLANT, HAMDEN, CONN. . . . . STate 7-5781
MIDWEST PLANT, CHICAGO 8, ILL. . . . . CAnal 6-2442

Reliance Customer Representative Offices

Dayton, O., Des Moines, Ia., Grand Rapids, Mich., Indianapolis, Ind., Jackson, Mich., Milwaukee, Wis., New York, N. Y., Rochester, N. Y., St. Louis, Mo., Toledo, O., Worcester, Mass.

RELIANCE *Job-Fitted* PRODUCTS

COLD ROLLED STRIP STEEL
Coils • Cut Lengths • All Tempers

SHEETS
Cold Rolled • Hot Rolled • H.R. Pickled
Galvanized • Long Terne
Standard or Production Sizes
Sheared or Slit to Actual Working Dimensions

DSC

Close-gauge Strip

gives engine bearing maker

99.86%

on-the-job performance

Here's a customer who manufactures precision engine bearings. During 1954 we shipped him 1,225,589 pounds of DSC STRIP for "backs."

Widths ran from 4" to 9"; thickness, from .050" to .156". All gauge tolerances had to be held ± .001" or .002" overall. That's "more restricted than standard" by as much as 66 2/3%. Standard tolerances for the specified sizes are .004" and .006" overall.

Of the total weight shipped all but 1,685 pounds proved right-on-the-nose for gauge, width, temper and finish . . . a score of 99.86% for on-the-job performance.

This tells the experience of only one of our customers to whom we shipped over 500 tons apiece last year. The fact is that three out of every five of such accounts scored DSC STRIP *higher than 99%* for job-performance and nearly half of them didn't reject a single pound or claim a dollar's allowance of any kind.

Whether your jobs call for standard or closer-than-standard thickness tolerance, light or heavy gauge, satin or bright finish, low carbon or high carbon spring steel . . . this is the kind of performance DSC STRIP gives you consistently when the tools, the job and the steel are properly mated.

Your nearest DSC Customer Representative will appreciate the chance to talk over with you the possibilities on your jobs.

DETROIT DSC STEEL

DETROIT STEEL CORPORATION

GENERAL SALES OFFICE—DETROIT 9, MICHIGAN

DSC CUSTOMER REPRESENTATIVE OFFICES

Chicago, Cincinnati, Columbus, O., Dayton, O., Detroit, Grand Rapids, Mich., Hamden (New Haven), Conn., Indianapolis, Jackson, Mich., Louisville, Ky., New York, Richmond, Va., St. Louis, Toledo, Worcester, Mass.

DSC MILL PRODUCTS

Hot Rolled and Cold Rolled Sheets
Cold Rolled Carbon Steel Strip — Flat Cold Rolled Carbon Spring Steel
Low and Medium Carbon Manufacturers' Wire — High Carbon Specialty Wire
Aluminum Cable Strand Reinforcement — Rope Wire — Tire Bead Wire
Welded Wire Fabric

COPYRIGHT 1955 D.S.C.

IN FURTHERANCE OF THE METAL STAMPING INDUSTRY

PMI

READY SOON — A valuable guide for Stamping buyers

PMI's BLUE BOOK OF STAMPING MANUFACTURERS

New edition lists up-to-date facilities of PMI member companies . . .
Reserve your free copy now by request on your business letterhead to
PRESSED METAL INSTITUTE, 2860 E. 130 Street, Cleveland 20, Ohio

OHIO

Here is Ohio Gear's new redesigned "baby" speed reducer, the horizontal double reduction 1/6 horsepower DOX. This sturdy and efficient unit has a modern zinc alloy housing, available in ratios of 4:1 to 1600:1, with torque capacities of 25 to 150 inch pounds. The DOX has a definite place in the fields of animated displays, home work shops, conveyors, barbeques, and domestic stokers.

Another recent addition to the right angle line is the compact RA-O. The capacity of this bevel gear unit supplements those of the RA-2 and RA-4; the new RA-O has ⅝" shafts and standard ratios of 1:1, 2:1, and 3:1 with ratings of 2, 1½ and 1 Horsepower, respectively, at 1800 RPM input speed. Assemblies available with output shaft vertically up or down, or both.

ESTABLISHED 1915

OHIO GEAR COMPANY

OHIO GEARS

1366 E. 179th ST.
CLEVELAND 10, OHIO

Foundry:

Improved permanent molds boost production.

Design and use of improved permanent molds made from high strength irons have played an important part in boosting production of large aluminum castings at Harsch Bronze and Aluminum Foundry, Cleveland.

Experience at Harsch Foundry during the past six years, using permanent molds made from Meehanite, have enabled the company to increase the weight of aluminum castings from 350 to 780 lb while saving both time and labor.

Cast Large Rotors

As part of a defense project in 1949, the Harsch Foundry was casting a large number of hollow aluminum turbo-blower rotors. Because of high physical properties specified for these rotors, the whole body and internal flanges had to be covered with chills. Since the rotor was 24 in. in diam by 30 in. in length and was being cast in sand molds, production was low and the process consumed too much time.

To speed production by reducing the labor necessary to set chills, a split outer mold was suggested. A 10 pct increase in the physical properties of the rotors was also specified. As a result, it was decided to incorporate a collapsible iron core and make a completely permanent mold.

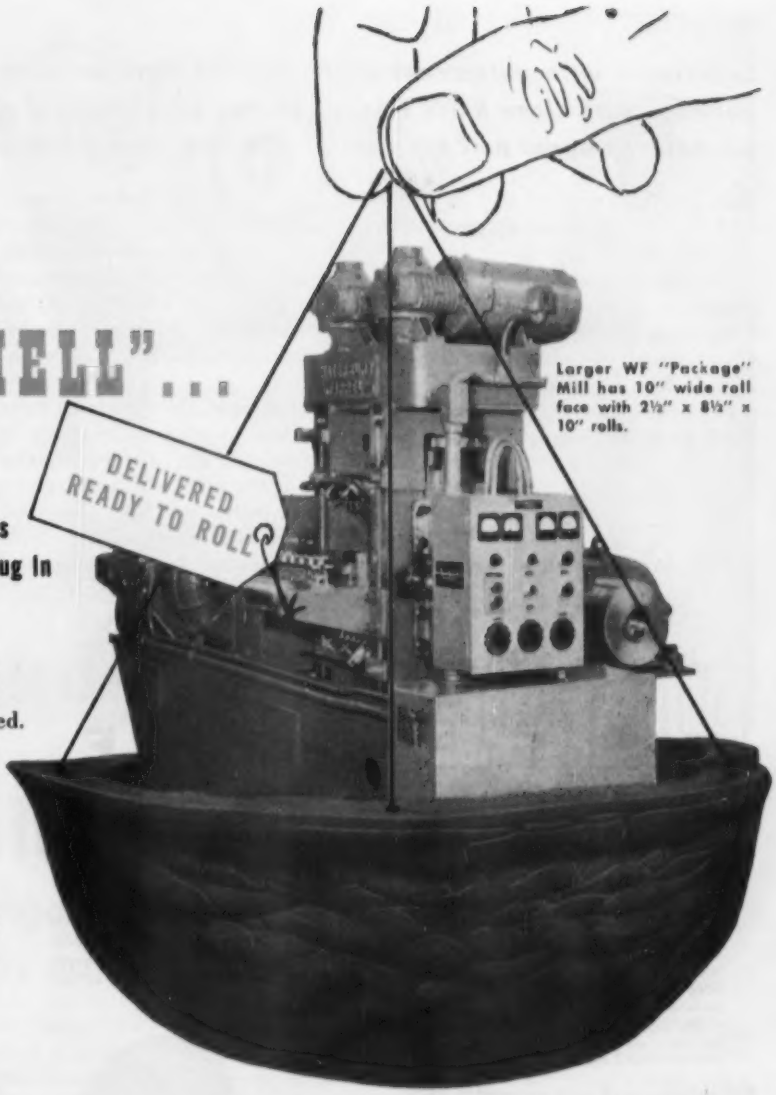
Many Problems Encountered

Many design and engineering problems were immediately encountered in pioneering these permanent molds because the alumi-

Twenty-five ton mold . . .

Waterbury Farrel's New, ONE-PIECE

STRIP MILL "IN-A-NUTSHELL"...

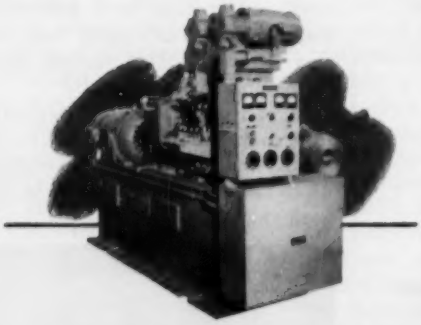


Larger WF "Package" Mill has 10" wide roll face with 2½" x 8½" x 10" rolls.

WF's 4-High "Package" Rolling Mills Are Compact, Low Cost, Ready To Plug In

You can start precision-rolling ferrous or non-ferrous strip as soon as you plug in the electrical connection.

This mill is completely self-contained. Drive, gear case, controls, lubrication system, winder and winder drive are assembled with the mill, itself, into a single, compact unit. When necessary, it can easily be moved in one piece to a new location.



Smaller WF "Package" Mill has 6" wide roll face with 1⅜" x 6½" x 6" rolls.

Some Construction Features: Mill frame of unit welded plate steel gives maximum strength and rigidity . . . assures greater accuracy and lasting alignment . . . alloy steel work rolls mounted in needle bearings . . . alloy steel back-up rolls drilled for water cooling, mounted in double row Timken bearings with tapered sleeve . . . independent power screwdowns . . . long and short roll necks and staggered couplings permit heavier construction for maximum torque capacities . . . lucite cover on welded steel gear case facilitates inspection . . . variable speed tension control drive, using AC power, cuts control cost and permits compact panel.

Contact Waterbury Farrel for complete details. No obligation.

WATERBURY FARREL FOUNDRY & MACHINE CO. • WATERBURY, CONN.

Offices: Chicago, Cleveland and Millburn, N. J.

A FEW OF THE MANY TYPES OF METAL WORKING MACHINERY MADE BY WATERBURY FARREL

MILL MACHINERY—Rolling Mills: Strip, Rod, Wire Flattening, (For Ferrous and Non Ferrous Metals) • Also Slitters • Straighteners • Cut-off Saws • Coilers • Winders, etc. *WIRE MILL EQUIPMENT*—Continuous Wire Drawing Machines (Upright Cone and Tandem) • Wire Flattening Mills • Chain Draw Benches • Pointers Swagers • Bull Blocks • String-up Machines • Spoolers, etc. *COLD PROCESS BOLT & NUT MACHINERY*—Headers (all types, • Rivet Machinery • Trimmers • Thread Rolling Machines • Slotters • Nut Formers and Tappers, etc. *POWER PRESSES*—Crank, Cam and Toggle: also Rack and Pinion Presses • Eyelet Machines Multiple Plunger Presses • Horizontal and Hydraulic Presses, etc.

WATERBURY FARREL FOUNDED 1851

WF-17

Experience with permanent molds showed that large aluminum castings with close finish tolerances and high physical properties could be made at about half the cost . . . Casting sizes increased . . .

num casting weighed 350 lb and had such high physical property specifications.

The design must allow for the correct amount of heat transfer. Shape and size of the gateway and riser must be correctly determined. The mold design had to provide an allowance for convenient accessory equipment necessary for operating door-closing, lock-up and stripping devices.

Material Important

Past experience had indicated that Meehanite metal was the most suitable material for casting permanent molds because of its high strength maintained at elevated temperatures, its rigidity, and its high resistance to corrosion, wear, thermal shock, warping and washing.

Accordingly, the problems were presented to Fulton Foundry & Machine Co., Inc., Cleveland, and many of the problems were solved cooperatively by the combined staffs of both companies.

The benefits derived from the construction of this first permanent mold for producing a 350-lb aluminum casting were so far-reaching that the industry gained an entirely new concept of the size and weight range for producing aluminum castings.

Allowed Faster Cooling

The new mold allowed faster cooling which in turn produced the required increase in the physical properties but still using the same alloy.

Where seven men had been able to produce only four castings per day using sand molds, four men could now produce 20 castings a day using half the foundry floor space.

Core room floor space was entirely eliminated. Longer service life was also proved by the fact that this particular mold produced 2500 castings.

Casting Cost Halved

This experience definitely demonstrated that large-dimesion aluminum castings with small finish allowance and high physical properties could be made with permanent molds made with Meehanite metal at approximately half the cost as with the former sand molds.

As a consequence, larger castings were now possible with larger molds, and soon castings weighing up to 780 lb were produced in full permanent molds.

Heavy aluminum castings . .

One Priceless Element In Every

POPE PRECISION SPINDLE

THE *Confidence* OF ITS USER

You can have complete confidence in the anti-friction bearings POPE puts into your spindles.

They are made to new super-precision tolerances.

You can depend upon Pope Spindles for the continuous production of accurate parts, fast removal of the surplus metal and fine low micro-inch surface finishes.

POPE Spindles have radial and axial rigidity capable of properly supporting modern cutting tools on high production work.

The shafts are large for extra rigidity and have enormous excess capacity.

With the POPE SYSTEM of Grease Lubrication used successfully for thirty-four years, there is no internal radial clearance for oil film in the bearings — none is required. Instead, the bearings are permanently internally preloaded for accurate centering and positioning of the shaft.

POPE leadership in spindle design and constant PROGRESS in engineering and manufacturing reduce your tolerances and production costs.

For trouble-free operation
YOU CAN SPECIFY POPE SPINDLES WITH *Confidence*

No. 103

Specify POPE PRECISION SPINDLES

POPE MACHINERY CORPORATION
Established 1920
261 RIVER STREET · HAVERHILL, MASSACHUSETTS

Which is the ECONOMY SIZE?

3 times stronger than carbon steel, Lukens "T-1" steel slashes equipment weight, reduces costs

The lighter weight, reduced thickness of Lukens "T-1" steel, in comparison to heavier, thicker plates of ordinary carbon steel, makes possible substantial over-all savings in material and fabrication costs for equipment builders. This new all-purpose steel—a unique, low-carbon, quenched and tempered alloy plate steel—has a yield strength three times greater than ordinary carbon steel. It can cut costs by reducing weight and still increase payload and efficiency.

Equipment fabrication is no problem with Lukens "T-1" steel. It is readily welded without preheating or stress relieving; equipment can easily be fabricated, modified or repaired at the field site. Its exceptional toughness and resistance to wear and impact lowers maintenance costs and lengthens equipment life. Additional savings are possible where Lukens' range of steel plate sizes—including the widest and heaviest available anywhere—makes possible the use of wider sizes that require fewer welded seams.

Lukens "T-1" steel is the most recent addition to Lukens' complete line of carbon, alloy and clad steels. Its unusual combination of properties suit it especially to application in pressure vessels, bridges, shipbuiliding, construction machinery and general industrial equipment. On problems of design, selection, application and fabricating techniques, Lukens offers full technical assistance. If you would like further information on Lukens "T-1" steel, write for Bulletin 765 on its properties, characteristics and applications. Address: Manager, Marketing Service, 772 Lukens Building, Lukens Steel Company, Coatesville, Pa.

LUKENS

"T-1" STEEL THE NEWEST IN A COMPLETE LINE OF ALLOY STEELS

LUKENS STEEL COMPANY, COATESVILLE, PA.

Gray Iron mounting plate, for use on a water circulating pump, was cast to shape with holes cored.

Casting or steel plate ...which costs less?

This pump mounting plate when it was flame cut from hot-rolled plate and drilled, cost $1.92.

Then it was redesigned in Gray Iron

Now it costs $1.33 . . . a saving of 30%. The holes are cored and the only finishing on the casting is surface grinding on both sides.

Economy is only one reason for redesigning parts in Gray Iron. This versatile metal can give you strength, rigidity, wear and corrosion resistance . . . and many other unique engineering advantages.

Call your nearest Society member foundry and the full facilities of this association will be available to help you. Or, write direct to Gray Iron Founders' Society, Inc., National City-E. 6th Bldg., Cleveland 14, Ohio, for helpful technical and business information.

MAKE IT BETTER WITH GRAY IRON

This symbol assures you the most for your casting dollar

Here's why it pays to call in one of the more than 500 leading foundries displaying the Society symbol:

- The most recent technical and business information is available to each member through the Society to help you design better products at lower cost.
- The use of sound cost accounting procedures is recommended and encouraged among Society member foundries, assuring full value for your casting dollar.
- Improved castings result from the advanced techniques and the high sense of responsibility of Society members.

GRAY IRON FOUNDERS' SOCIETY

TECHNICAL BRIEFS

Graphites:

Oxidation rates established in recent NBS studies.

A set of numerical constants has been established for oxidation rates of natural graphites in oxidizing atmospheres as a result of recently completed study made by the National Bureau of Standards refractory laboratory.

Coarser sizes of graphites having a graphite content of about 85 pct are difficult to oxidize either in air or in a stream of oxygen at 400°C, the study shows.

When fine and coarse sizes are combined, however, as in finished but unglazed crucible bodies, a slow oxidation begins at 400°C, and the rate increases at higher temperatures with a definite deterioration of the body.

Longer Crucible Life Wanted

Natural flake graphite is one of the essential constituents of crucibles for melting nonferrous metals. However, the susceptibility of graphite to oxidation, beginning at comparatively low temperatures and becoming progressively more severe at higher temperatures, tends to limit its usefulness in many crucible applications.

To increase the service life of crucibles and to make possible the selection of better grades of crucible graphites, an extensive study of the refractory properties of these materials has been undertaken by the Bureau.

Samples Grouped

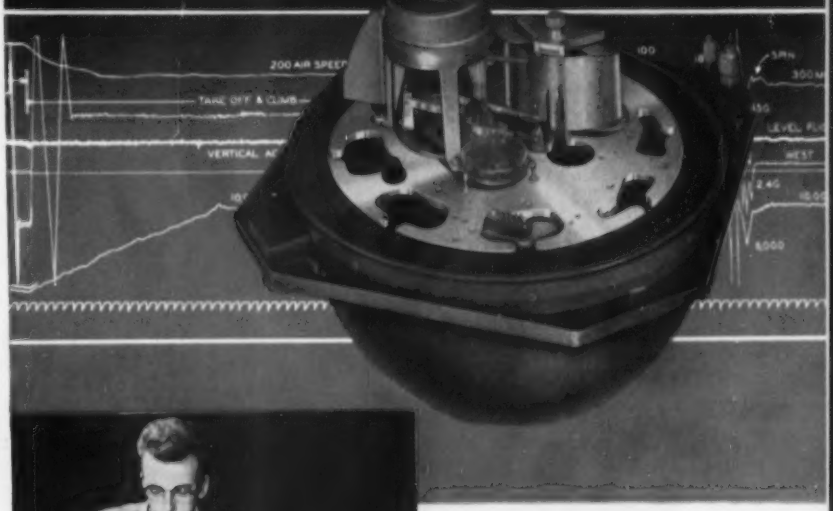
Three different groups of graphites were selected from among 20 samples for correlating various properties.

Experiments in the first group compared the source of graphite with oxidation rate; in the second group, particle size with oxidation rate; and in the third group, oxidation rates were compared for selected samples.

Each sample was fractionated according to sieve size, and the particles passing the No. 40 sieve and remaining on the No. 50 sieve appeared to be the coarsest frac-

Spincraft did it for General Mills

Spincraft can do it for you!

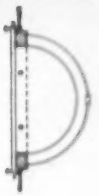


Spun spheres protect mechanical fingers of world's toughest recorder

another example of Spincraft's "start-to-finish" fabrication

15 Different Operations —

The sphere, protecting the delicate sensing instruments, is completely fabricated by Spincraft. The sphere consists of an outer steel and inner aluminum shell separated by insulating material. The two hemispheres are joined together by an ingenious locking and sealing arrangement. Spincraft's complete fabricating responsibility involved spinning, machining, arc-welding, spot welding, brazing, grinding, sawing, drilling, braking, stamping, phosphate plating, anodizing, painting, assembly and pressure testing. Craftsman (above) is shown assembling a Flight Recorder.



This aircraft Flight Recorder, manufactured by the Mechanical Division of General Mills, etches a continuous 300-hour record of heading, air speed, vertical acceleration and altitude on aluminum foil. Each Recorder is fully-enclosed and protected in a specially fabricated sphere — made by Spincraft. The recording device, when enclosed in the sphere, is designed to withstand shocks of 100G's and resist temperatures of 2000°F up to 30 minutes.

This is another example of Spincraft's versatility and manufacturing skill. We offer complete facilities for contract manufacture of finished parts, assemblies and complete products.

Take advantage of our modern tools for spinning, deep drawing and stamping as well as complete fabrication. They can pay off in savings for you.

Write for Spincraft data book. If you have a specific problem, tell us about it — no obligation.

WORKSHOP OF AMERICAN INDUSTRY SINCE 1919

World's largest plant fully equipped for all types of metal spinning • deep drawing • stamping • fabricating

Spincraft

SKILL WILL DO IT

INCORPORATED

see our catalog in Sweet's or write for copy

4140 WEST STATE STREET • MILWAUKEE 8, WISCONSIN

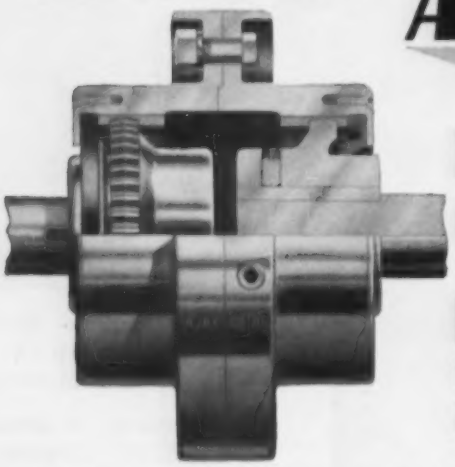
tion common to all graphites. This fraction was therefore selected in the first group for comparison of oxidation rates for graphites from 11 different sources but including only one sample from Madagascar.

Effect of Volatile Content

For the second group, flake graphite samples from Alabama, Pennsylvania, and Madagascar were chosen for comparison of particle size with rate of oxidation. In the third group, the oxidation rates were compared among the graphites from ten Madagascar deposits only. The fraction passing through the No. 16 sieve and remaining on the No. 20 sieve was selected for this group.

YOU can afford

AJAX



DIHEDRAL COUPLINGS

because
the best coupling is the cheapest

Whether your executive position concerns design, manufacturing, selling, maintenance or service, — the performance of your equipment depends on the coupling!
AJAX Dihedral Couplings are radically improved gear-type couplings designed to handle offset, angular and end float shaft misalignment far beyond capacities of conventional flexible couplings.
Simplify your machine design, manufacturing, installation and maintenance. AJAX Dihedral Couplings make it possible to design misalignment into heavy duty equipment as well as out.

Exclusive AJAX Dihedral tooth design* permits holding tooth clearance (backlash) to lubrication film requirements. Load is distributed at center of teeth, the point of greatest strength. All teeth are hardened to combine hard wear surface with tough core. Seals keep lubrication IN.

Phone the AJAX representative or write the factory for case histories, — you will spark-plug some worth-while thinking.
Also manufacturers of a complete line of AJAX Rubber-Bronze Bushed Couplings and Vibrating Conveyors.

Representatives in Principal Cities • Consult your Telephone Directory

AJAX FLEXIBLE COUPLING CO. INC.
*Patents Pending
WESTFIELD, N. Y.

Oxidation rate, amount of volatile matter, and graphitic content of the samples were determined with a carbon train apparatus. The equipment consisted essentially of three parts: absorption tubes for purifying the gas, a multiple-unit electric-tube furnace, and absorption tubes for the products of combustion.

When a sample was to be processed, approximately 0.1 g of the graphite was placed in a combustion boat and heated to 110°C to remove the moisture. It was then inserted into the tube furnace which was preheated to 900°C.

Heated and Cooled

To remove volatile matter, the graphite sample was heated for successive 15-minute periods in an oxygen-free nitrogen atmosphere. After each heating period, it was cooled and weighed. The process was continued until a constant weight was attained.

The oxidation rate was found by measuring the rate of evolution of carbon dioxide from a dry volatile-free graphite sample. The sample was heated in the tube furnace at 900°C in an oxygen stream.

Carbon dioxide resulting from the oxidation was absorbed in tubes containing both ascarite and magnesium perchlorate. The tubes were weighed at intervals during the run until no further gain in weight was indicated.

Flake Thickness Varies

Weight of the carbon dioxide was multiplied by the ratio between the weights of carbon and carbon dioxide to find the weight of the carbon alone, and the percentage of graphitic carbon was then found by dividing the total weight of the carbon by the weight of the dry volatile-free graphite sample.

Residue from the oxidation test is considered ash. All samples had been refined to contain at least 85 pct graphite.

The average flake thickness of the samples was determined by measuring individually 75 to 100 flakes in a machinist's micrometer. Since surface area of the particle

Oxidation rate of graphite generally increases as the particle size decreases . . .

is related to rate of oxidation, it was obtained using the nitrogen sorption method.

Particle Size A Factor

From the analyses made in this investigation, it was found that the oxidation rate of graphite generally increases as particle size decreases. This change in oxidation rate is to be expected since the rate of reaction of a solid with a gas depends on the surface of the solid exposed to the gas at any given instant.

For the 11 graphites from foreign and domestic sources, the best correlation noted was that of the oxidation rates with surface areas obtained by the nitrogen sorption method.

Alabama and Pennsylvania samples had oxidation rates that were not greatly different from those of the corresponding particle sizes of samples representing the graphites imported in large quantities from Madagascar. Of the 10 different Madagascar deposits, four different distinct oxidation rates were noted. As a final result of this study, a set of numerical constants was established for the oxidation rates of natural graphites. These constants should prove useful in the future selection of particular graphites and of particle sizes of graphites for individual applications.

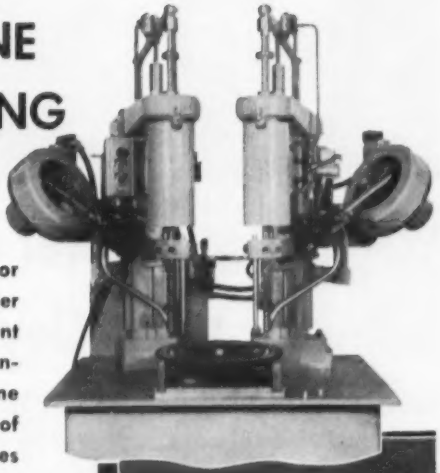
Course In Radioisotopes

Rapidly growing importance of radioisotopes in industry will be emphasized in a two-week course to be held at Purdue University, Lafayette, Ind., July 25 to Aug. 5

The course, "Basic Radiochemistry and Applications," is designed to aid in meeting the acute shortage of trained personnel in this field. Scientists and engineers will learn how radioisotopes can help solve problems in research, development, manufacturing, and control. Leading atomic scientists will participate as instructors.

Dependability! Precision! Speed! ....

Three Important Production Factors Presented by the DPS LINE OF ASSEMBLING EQUIPMENT



● Do you have a feeding or assembly problem? Remember that DPS stands for equipment that will bring you greater earnings, lower costs and on-time schedules . . . A complete line of modern power-driven machines that assures performance in keeping with the increased tempo of present-day production.

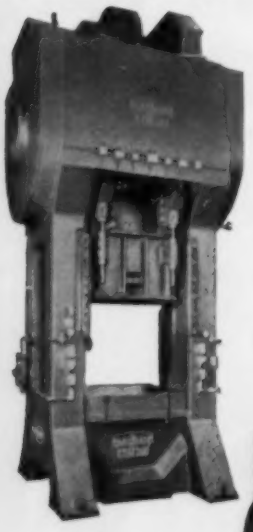
Give Us your Problem . . . Send Sample Assembly . . . No Obligation!

POWER SCREWDRIVING MACHINES
•
SELECTIVE PARTS FEEDERS
•
SPECIAL ASSEMBLY MACHINES

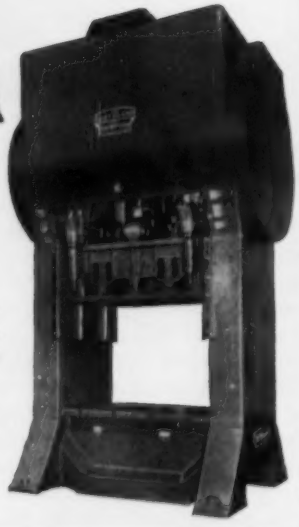
DETROIT POWER SCREWDRIVER CO.

2811 W. FORT ST. DETROIT 16, MICH.

Cleveland Double Crank Double Action Toggle Press—400-ton capacity



Cleveland Single Crank Double Action Toggle Press—200-ton capacity



Cleveland Double Crank Double Action Toggle Press—200-ton capacity

YOU'LL HAVE fewer DEEP DRAW OR STAMPING rejects WITH Cleveland Toggle Presses!

The design of Cleveland Double Action Toggle Presses assures *smoothness of action, perfect timing and absolute dwell of blank-holder slide.* Powerfully constructed and having an ample over-load capacity, they consistently produce difficult deep drawings and stampings accurately. You'll enjoy their trouble-free operation and simplified maintenance. Adjustments are easy.

Cleveland Toggle Presses are designed so that when the blank-holder toggle arms straighten out, the entire blank-holder pressure is transmitted to the frame. This permits total use of crankshaft power for the drawing operation.

Before you buy your next press, won't you let us give you the complete Cleveland story? We make 11 types of Cleveland Presses to assure utmost stamping economy. Just write or call today!

Why Settle for Less than a Cleveland Press

THE CLEVELAND PUNCH & SHEAR WORKS CO.

Established 1880

1880 75 1955 YEARS OF CONSTANT PROGRESS *Diamond Anniversary*

POWER PRESSES

FABRICATING TOOLS

E. 40TH & ST. CLAIR AVENUE • CLEVELAND 14, OHIO

Offices at: NEW YORK • CHICAGO • DETROIT • PHILADELPHIA • E. LANSING • OXFORD, O.

CITY FOUNDRY DIVISION SMALL TOOL DEPARTMENT

NATIONAL AIROIL

Oil Burners

OF THE STEAM AND MECHANICAL TYPES NOW COMBINED INTO

Dual Stage BURNERS

Now, at last, the inherent advantages of *both* systems of fuel oil atomization are *profitably* yours . . . within the one, new NATIONAL AIROIL Dual Stage Burner.

43 years of combustion equipment design and manufacture are in back of the Dual Stage Oil Burner . . . and, it has been thoroughly tested and proved in the field for firing: Petroleum Processing Heaters; Rotary Kilns; H.R.T., Scotch Marine and Water Tube Boilers; etc.

Available in three sizes, the NATIONAL AIROIL Dual Stage Burner fires all grades of fuel oil from No. 2 to No. 6, with a ready capacity of 80 to 300 g.p.h. Further, for a perfect flame pattern, we would recommend using with the Dual Stage Burner either the NATIONAL AIROIL Universal Register for forced draft, or the NATIONAL AIROIL Tandem Unit for natural or induced draft furnaces.

Get detailed description, illustration, and specifications in NATIONAL AIROIL Bulletin 25.

OIL BURNERS and GAS BURNERS for industrial power, process and heating purposes
STEAM ATOMIZING OIL BURNERS
SLUDGE BURNERS, Steam Atomizing
MOTOR-DRIVEN ROTARY OIL BURNERS
MECHANICAL PRESSURE ATOMIZING OIL BURNERS
DUAL STAGE, combining Steam and Mechanical Atomization
LOW AIR PRESSURE OIL BURNERS
AUTOMATIC OIL BURNERS, for small process furnaces and heating plants
GAS BURNERS
COMBINATION GAS & OIL BURNERS
FUEL OIL PUMPING and HEATING UNITS
FURNACE RELIEF DOORS
AIR INTAKE DOORS
OBSERVATION PORTS
SPECIAL REFRACTORY SHAPES

Established 1912 — *Incorporated 1917*

NATIONAL AIROIL BURNER COMPANY, INC.

1271 E. Sedgley Ave., Philadelphia 34, Pa.
S. W. Division: 2512 So. Blvd. Houston 6, Texas

New Books:

Problems of interest to management are discussed in pamphlets recently issued by the Research Div., California Personnel Management Assn. Included are:

"Communicating In Business," by E. F. Fitzmaurice, Product Service Manager, General Foods Corp.

"Company President Looks At Human Relations Problems," by C. H. Percy, President, Bell & Howell Co.

"Trends and Developments in Industrial Relations," by J. J. O'Donnell, Personnel and Labor Relations Manager, The Lummus Co.

"Planning A Sound Industrial Relations Program," by G. E. Morse, Vice-President, Minneapolis-Honeywell Regulator Co.

"What's Wrong With Personnel Programs," by R. I. Pearce, General Director, Sales Personnel, Reynolds Metal Co.

"The Annual Wage Drive and Unemployment Insurance," by Frank Foisie, Vice-President, Federated Employers of San Francisco.

Copies of these pamphlets ($1.00 each) may be obtained from CPMA at 2180 Milvia St., Farm Credit Building, Berkeley 4, Calif.

"Nachschlagewerk Fuer Die Montan-Union." A 1000-page reference book on the huge Montan-Union industrial combine. Gives organization and structure, statistics and other vital reference data on the present union and all of the individual member companies. A valuable reference work for many business people. Business Publications, Box 154, Mamaroneck, N. Y. $15.00.

"Minerals In World Industry," by W. K. Voskuil. Concerned primarily with the part played by minerals in economic productivity and in establishment and maintenance of a high standard of living. Also discusses international political aspects of mineral resources. McGraw-Hill Book Co., Inc., 330 West 42nd St., New York 36. $5.75. 324 p.

Do you want an abrasive that...

LASTS LONGER?

TRU-STEEL does because it is scientifically heat-treated, then drawn to precise tolerances. Thanks to its durability, *TRU-STEEL saves you money.*

SAVES PARTS?

TRU-STEEL will not break into fines that cause wear of machine parts. Cutting down-time and parts replacement, *TRU-STEEL saves you money.*

CLEANS FAST?

Controlled chemistry and careful control checks give TRU-STEEL the exact hardness for fast, thorough cleaning. Speeding production, *TRU-STEEL saves you money.*

COSTS LESS?

In sizes most popular for blast cleaning, TRU-STEEL costs less than any other steel shot of comparable analysis and heat treatment! In purchase price, in performance cost, *TRU-STEEL saves you money.*

For full information and prices, write to:

STEEL SHOT PRODUCERS, INC.
BUTLER, PA.
Subsidiary of Pittsburgh Crushed Steel Co., Pittsburgh, Pa.

"Publications from the Institute." Comprehensive listing of publications from the Massachusetts Institute of Technology. Office of Publications, Room 7-204, Massachusetts Institute of Technology, Cambridge 39, Mass. $.50. 80 p.

"The Coming Revolution in Industrial Relations." Covers major problems faced in industrial relations, including the effects of automation and high mechanization machinery. Industrial Relations News, 230 West 41st St., New York. $4.00. 76 p.

"Corporate Insurance Buying: Guides to Improved Efficiency." Contains five papers on insurance problems facing management today. Includes: A Rational Basis for Buying Insurance; Applying Sound Principles to the Buyer's Task; Manuals for Insurance Administration; Organizing the Insurance Department for Efficiency; British and American Underwriters Today — A Contrasting Picture. American Management Assn., 330 West 42nd St., New York. $1.25. 39 p.

"Significant Trends In Corporate Insurance." Discusses trends in benefits for retired employees, comprehensive liability coverage, fire insurance, casualty insurance, fidelity insurance and construction surety bonds. American Management Assn., 330 West 42nd St., New York. $1.25. 40 p.

"Company Experience In Improving Packaging Efficiency." A six-part discussion of the packaging function in a large chemical company and the experience of three other companies in packaging products which presented problems of more than average difficulty. American Management Assn., 330 West 42nd St., New York 36. $1.25. 48 p.

"Plant and Process Ventilation," by W. C. L. Hemeon. The author, engineering director of Industrial Hygiene Foundation of America, Inc., Mellon Institute, has brought together his vast knowledge and experience in ventilation problems and ventilation system design. Emphasis has been placed on estimating ventilation quantities required in various industrial situations. The Industrial Press, 148 Lafayette St., New York 13. $9.00. 437 p.

"Plastics Tooling," by M. W. Riley. Presents a review of basic information on plastic tooling. Step by step procedures in making plastic tools are shown. Reinhold Publishing Corp., 430 Park Ave., New York 22. $2.50. 123 p.

"Better Tool Cribs," by William Raisglid. A guide to tool crib layout and efficient handling and storage of tools and materials. Tells how to set up a tool control system. Shows how milling cutters, honing units, counterbores, measuring tools, gages and other items should be stored. The Industrial Press, 148 Lafayette St., New York 13. $4.00. 152 p.

FOUND [illegible]ERE WORLD FAMOUS AIRCRAFT ARE "BORN"

GRAND RAPIDS GRINDERS

Just take a look in their toolrooms! Every one of these famous aircraft manufacturers uses Grand Rapids Grinders . . . engineered and built for unusual long life of precision grinding. Our Model 55 shown here, for instance, features column and base of massive, one-piece casting for vibrationless rigidity and permanent alignment. Both longitudinal table travel and cross feed are hydraulically actuated. Wheel head has powered rapid vertical travel. Table speed is variable up to 125 fpm . . . faster than any other of this type and size.

That's why so many tool room men insist on Grand Rapids Grinders.

Grand Rapids No. 55 Hydraulic Feed Surface Grinder
This precision tool room type machine Table speed up to 125 fpm. Working surface of table is 12" x 36". Vertical movement of wheel head 18". Preloaded ball bearing spindle greased for life. Spindle speeds 1925 and 2500 rpm.

Just a note on your letterhead will bring you full details.

GALLMEYER & LIVINGSTON

GALLMEYER & LIVINGSTON COMPANY 400 Straight Ave., S.W., Grand Rapids, Mich.

Steelmaking:

New methods change steel plant procedures.

Four "revolutionary developments" in making specialty steels can eliminate many conventional operations and thus cut production costs, H. George De Young, executive vice president, Atlas Steels Ltd., Welland, Ontario, told the General Meeting of American Iron and Steel Institute in New York recently.

Steel Plant of Future

The new developments (THE IRON AGE, Nov. 4, 1954), are the continuous casting process, an automatic scarfing machine for stainless steels, the Sendzimir hot planetary mill and the electrolytic salt descaling process, the author said.

By producing semifinished products direct from molten steel in the continuous casting machine, the specialty steel plant of the future will be able to dispense with the ingot molds, soaking pits and perhaps the blooming mills now used, Mr. De Young explained. He described the development of, and the changes in operations occasioned by the continuous casting machine in the Welland plant.

Handling Time Saved

Much time-consuming handling and manual work are saved by the recently developed continuous scarfing machine for stainless steels, according to the author. The very high temperatures generated by the scarfer make it possible to improve the surface of stainless slabs by burning imperfections off without halting operations as in the past, he said.

New Cleaning Methods

Experience to date indicates that the specialty steel plant of the future will have a finishing mill, such as the new Sendzimir hot planetary mill, which reduces the thickness of steel from billet to strip in a single pass, directly following the continuous casting machine, Mr. De Young said. "It is almost a foregone conclusion that future plans for rolling mill setups will substitute the continuous casting machine for the billet yard," he asserted.

Replaces Mechanical Process

A continuous process for cleaning the surface of hot and cold rolled strip has been developed to replace the mechanical scale-breaking process, Mr. De Young told the meeting. The new process uses salts and an electric current. As the current is not needed for descaling cold rolled strip, it can be used on the tanks set up for electrolytic pickling, he explained.

The new Welland, Ont., plant represents a major forward step in modern steelmaking facilities.

Here is a completely new electric-hydraulic forcing and straightening press, with construction and operating advantages never before offered in a low-cost shop press.

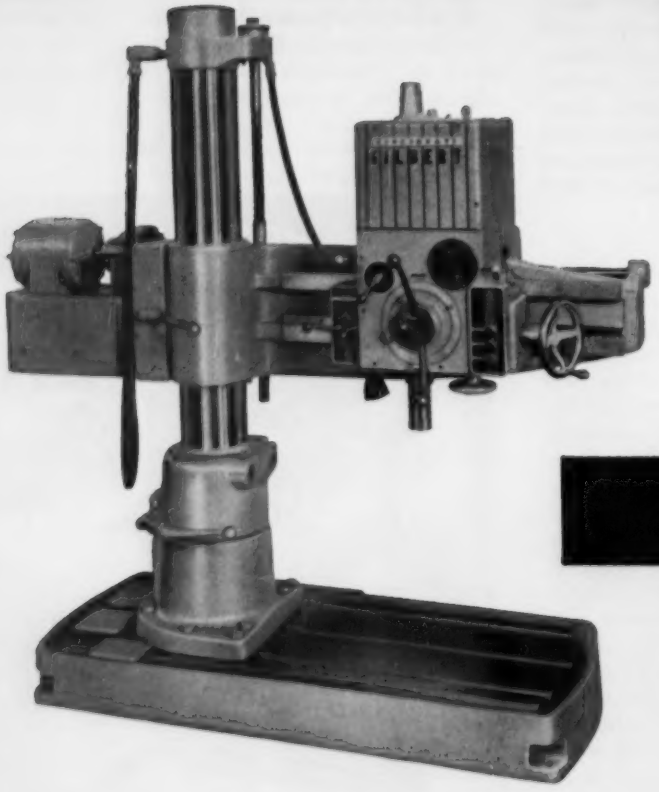
These are a few of the features:

- **Rapid Ram Approach** — Automatically changes to power stroke when it contacts the work.
- **Movable Workhead** — Self-contained—easy to center over the work. Workhead can be purchased separately.
- **Variable Ram Speed** — From zero to maximum under fingertip control.
- **Modern Design** — All operating controls at convenient working height.

These and dozens of other features are fully described and illustrated in new Bulletin No. 347, which we will send promptly on request. Send the coupon today.

DAKE PRESSES

DAKE CORPORATION
602 Seventh Street, Grand Haven, Mich.
Please send Bulletin No. 347
Name_____
Company_____
Address_____
City_____ Zone____ State_____



NEW

- 9" column; 3' or 4' arm
- spindle speed ratio of 40-to-1
- 12 speeds (up to 3200 rpm) through direct-reading dial
- automatic tapping reverse
- adjustable spring counterbalance
(feel remains the same from lightest to heaviest tools)
- hardened tang slot
- safety elevating nut and screw (arm can't drop or overrun)
- rigid, accurate spindle mounted on 5 precision ball bearings

This *completely new* light duty 3 HP radial gives you more advances for your money than any machine of equal capacity, at a price that makes replacement easy and attractive. At the left are some of the features that put you ahead when you own this Gilbert. Your replacement dollar is worth more when you buy a Gilbert. Write for Bulletin Number 255.

The Cincinnati Gilbert Machine Tool Co.,
3366 Beekman St., Cincinnati 23, Ohio

those who buy Gilbert buy **GILBERT** *again*

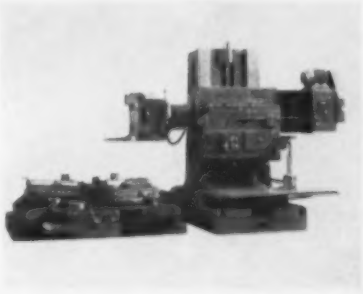
NEW EQUIPMENT

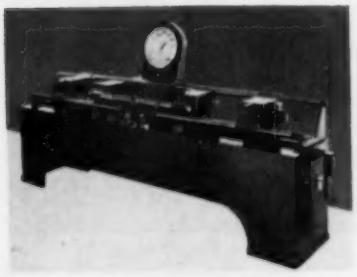
New and improved production ideas, equipment, services and methods described here offer production economies . . . for more data use the free postcard on page 97 or 98

Cuts off risers from heavy steel castings

A new universal type cold sawing machine, announced by Gustav Wagner Machine Tool Works of Reutlingen, Germany, cuts off risers from heavy bulky steel castings. Saw head of the Model WKU may be turned in any position—horizontal, vertical, or any required angles and the saw arbor can be closely adjusted to right angles to the cutting plane. Both carriage on the column and the column itself have all directional power feeds and can be traversed at right angles to the cutting direction. Work table can be equipped with rotary motion for removal of slag rim adhering to circular castings. *Klingelhofer Machine Tool Co.*

For more data circle No. 29 on postcard, p. 97.





Tests butt welds in thin wall square tubing

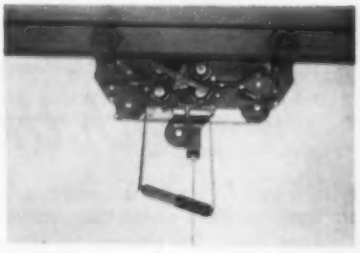
A 100,000-lb capacity tensile testing machine is designed for testing the butt welds in thin wall square tubing now being used for certain automotive frames. It tests both 2½ and 3½ in. square tubing without alteration, because it has two stations, one on each side. Difficulty in holding this kind of specimen was overcome with an ingenious, hydraulically operated mandrel and gripping device. This type machine is available with either one station or two, and may be had with specimen holding devices for square, rectangular, round or oval tube. *Detroit Testing Machine Co.*

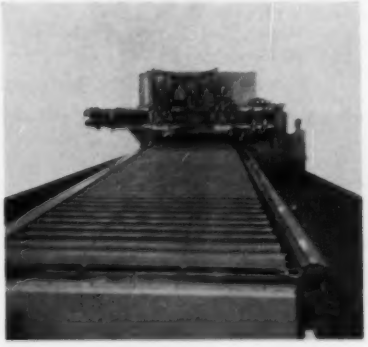
For more data circle No. 30 on postcard, p. 97.

Automatic tool and dual-load balancing hoist

This tool and dual load balancing hoist is built for interchangeable equipment to balance any range of weight. A tool mounted on the balancer can be in position for instant application; lost motion is eliminated, production is increased. Very little energy is required to raise or lower the balanced object. The horizontal models are designed primarily for use where low ceilings are encountered. They operate on a 4 or 6 in. standard I beam. Standard balancing range is 42 in. *Platz Co.*

For more data circle No. 31 on postcard, p. 97.



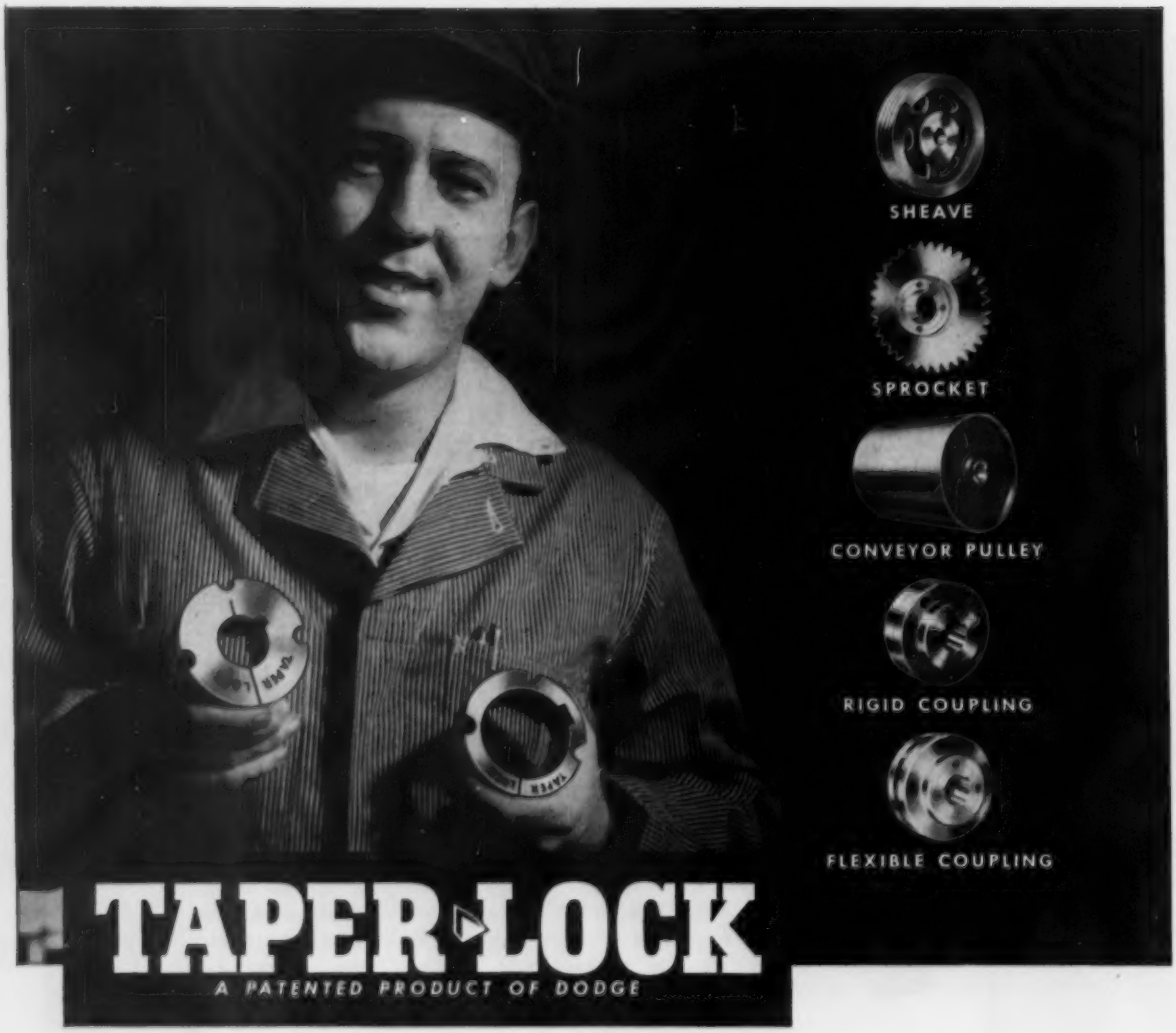


Mills aluminum parts to any desired contour

The A-72C milling machine is a combination profile, skin milling and spar milling machine. Its primary function is to mill aluminum parts to any desired contour. This is accomplished with the use of one, two, three or four cutterheads as required. The A-72C, which was built for Boeing, has three heads, capable of taking simultaneous contour, profile and angular cuts. Basic design of the machine is conventional with Onsrud. Table and beds are stationary, with the gantry type carriage supporting the cutter heads which pass over the work. A 3 hp GE Thy-Mo-Trol drive powers the carriage longitudinally along the bed ways at variably controlled speeds up to 9 fpm and 18 fpm rapid traverse. *Onsrud Machine Works, Inc.*

For more data circle No. 32 on postcard, p. 97.

Turn Page



"Brother...you sure can save with these interchangeable bushings!"

With a few Taper-Lock bushings you can make quicker changes and cut down-time on production machines—because Taper-Lock bushings are *interchangeable*. Shift from a Dodge sprocket to a Dodge sheave, and use the same bushing! Taper-Lock bushings are available in a range of sizes which makes changing from one size shaft to another equally easy and quick.

Mount 'em all with Taper-Lock bushings—your sheaves, sprockets, couplings, conveyor pulleys. They slip on the shaft quickly—hold with the firmness of a shrunk-on fit—come off easily without shock to bearings or machinery. Standardize, economize with Taper-Lock.

DODGE MANUFACTURING CORPORATION, 800 Union St., Mishawaka, Ind.

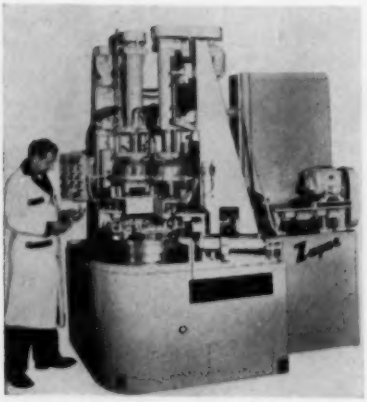
CALL THE TRANSMISSIONEER, your local Dodge Distributor. Factory trained by Dodge, he can give you valuable assistance on new, cost-saving methods. Look for his name under "Power Transmission Machinery" in your classified telephone directory, or write us.

THERE'S ONLY ONE TAPER-LOCK, THE BUSHING THAT MOUNTS FLUSH!

DODGE

of Mishawaka, Ind.

Drills, reams and taps typewriter supports



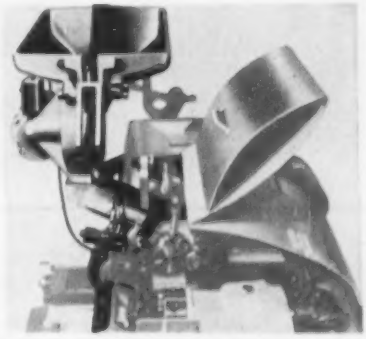
A 4-station drilling, reaming and tapping machine processes diecast segment supports for an electric typewriter. At station one, 10 holes are drilled; a vertical head reams 2 holes at station No. 2, and taps simultaneously four No. 10-32P holes in the outer face of the casting. The part is processed from the top and from the side. Heads are standard basic Zagar design, and the feeds of the heads are by hydraulic units, each with 10-in. strokes. Tapping head has lead-screw for precise control. The indexing table is actuated by a standard air cylinder for automatic cycling. A shot-pin assembly positions the table. In addition, the table is tied to the drill heads by guide pins. Indexing accuracy, therefore, is doubly assured. The machine is fully automatic with safety provisions and complete control panel. *Zagar Tool, Inc.*

For more data circle No. 33 on postcard, p. 97.

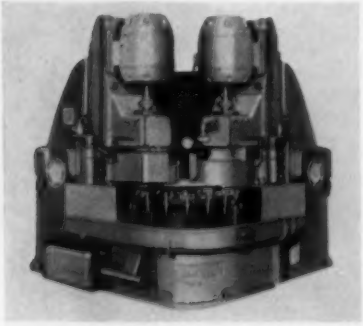
Usefulness of screw machine doubled with Auto-Load

New hopper-feed mechanism automatically feeds second operation parts into a Brown & Sharpe automatic screw machine. An Auto-Load equipped screw machine can feed, locate, machine and eject a wide variety of small pieces with the same fully automatic ease as bar stock. For second operation work, the machine can use the front and rear cross slides and six turret positions. With the Auto-Load still attached, a simple changeover quickly changes the machine to bar stock work. Auto-Load comes complete with all parts and instructions for installation. Machine conversion requires about 6 to 8 manhours. Available for OG, OOG and 2G B&S machines. *Hi-Shear Rivet Tool Co.*

For more data circle No. 34 on postcard, p. 97.



Single-pass grinder processes connecting rods



Production rate of an automatic double-spindle, single-pass, rotary table grinding machine is 400 large truck engine connecting rods per hour. Mechanical clamping and unclamping devices operate automatically as each workholding fixture rotates past actuating cams bracketing the loading station. Rough forgings are finished in one pass under the wheels. One wheel grinds the crank ends, the other the pin ends. Stock removal is 0.008 in. on each side. Automatic down feed—actuated by sizer-gages which constantly and accurately check dimension being machined at each wheel head—compensates for wheel wear and permits uninterrupted production with only spot-checking of parts. *Mattison Machine Works.*

For more data circle No. 35 on postcard, p. 97.

For small lot production or experimental work

A wide variety of parts can be finished in a relatively short time cycle in this semiautomatic mechanical finishing machine. Called the Roto-Mite, the machine is designed with a removable tub in which finishing mass is contained and rotated. Several tubs with different type masses can be used. They can be changed quickly to allow changeover from one operation to another. The tub measures 44 in. diam with a working depth of 13 in. and is a complete unit with built-in sludge removal system. No modification or adjustment of the driving mechanism is necessary to remove the tub as the drive is a separate unit on which the tub is mounted. Main drive is a 5 hp U. S. Varidrive vertically mounted in rear of the machine. A remote speed control allows selection of processing speeds from 100 to 500 fpm. *Roto-Finish Co.*

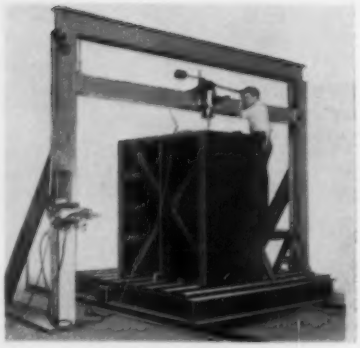
For more data circle No. 36 on postcard, p. 97.

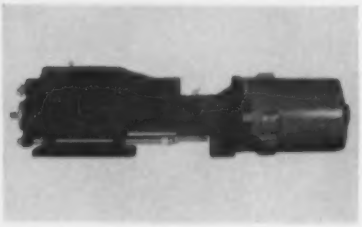
Turn Page

Drills and taps straight rows of holes

Drilling and tapping machine, designed for large weldments and castings, operates on rectilinear coordinates so that straight rows of holes can be drilled and tapped on horizontal or vertical surfaces quickly and with minimum adjustment. The electrically operated dolly of the unit has a load capacity of 10,000 lb and is equipped with remote jogging switch for accurate positioning of the work. Frame which supports the drills can be free-standing or attached to existing steel structural members. Unit shown handles pieces up to 12 ft wide. The machine will drill and tap holes to 1 in. diam in steel. Drill units are interchangeable and can be furnished with manual, pneumatic or hydraulic feed. Handles jobs requiring large number of holes on rectilinear coordinates. *L. A. B. Corp.*

For more data circle No. 37 on postcard, p. 97.





Direct-spindle tapping without tapping heads, clutches

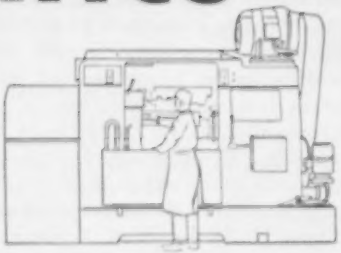
New controlled-air-power device for direct-spindle tapping without tapping heads or clutches basically consists of a Bellows-Locke Model 5-E drill unit with a special, inline-mounted, GE hi-slip motor for 220/440 v, 3-phase operation. Standard shaft speed is 1140 rpm. The unit features rapid air-powered approach to the work and smooth hydraulic feed through the work at any preset rate desired. Tap sizes can range up to 5/16-18 or ⅜-24 in mild steel. *Bellows Co.*

For more data circle No. 38 on postcard, p. 97.

LET SIMMONS REBUILD AND MODERNIZE YOUR AUTOMATICS

Investigate the important production, maintenance and tax savings of SIMMONS ENGINEERED REBUILDING for your: Lathes, Planers, Surface Grinders, Cylindrical Grinders, Vertical Millers, Openside Planers, Automatics, Vertical Boring Mills, Turret Lathes and Radial Drills.

A qualified Simmons rebuilding engineer will discuss it with you. Write, wire or phone today. Simmons Machine Tool Corporation, 1721 North Broadway, Albany 1, N. Y.



Write for Simmons Way... case histories of rebuilding jobs.

SIMMONS GIVES MACHINE TOOLS A NEW LEASE ON LIFE

Unconditional guarantee... our standard since 1910

100-ton press

New double crank welded steel press available to the mass production metalworking field is built with 40, 50 and 60 in. between uprights and 32 in. f to b. Speed range is 80 to 240 strokes per minute. The press features cylindrical type ram for accurate alignment and air clamped feeds to prevent stock distortion and permit positive feeding. The press is available with single or double feeds and scrapcutter. Standard equipment includes balanced crankshaft, air counterbalances, automatic metered lubrication system, wired electrical control system. *Di Machine Corp.*

For more data circle No. 39 on postcard, p. 97.

Turn Page

Ren•ite PLASTIC TOOLING NEEDED TO COMPETE TODAY

Take the case of this automotive body with Master Keller Models in cubed position

TOOLING TIME CUT AS HIGH AS 70%

A definite proof of Ren-ite Plastic Tooling doing a job better. This builder of fine cars accepted the challenge of higher production at lower production costs. Savings in tooling costs plus faster checking operations have helped to hold the price line on this 1955 car.

Check Your Tooling Costs . . Investigate Ren-ite Plastic For the LOW COST ANSWER

Ren-ite is the dimensionally-stable tooling plastic of Thermosetting Resin used as a laminating or casting plastic without application of heat or pressure. For Keller models . . . duplicators . . . spotting racks . . . draw dies . . . drop hammer dies . . . core boxes . . . drill fixtures and new ones are being developed each day.

FREE ENGINEERING SERVICE
NO CONTRACT REQUIRED

Ren•ite
PLASTICS, INC.
3181 South Cedar Road, Lansing 4, Michigan
Offices in Chicago, Cleveland, Detroit, Los Angeles, New York and St. Louis

WHOOOEE!

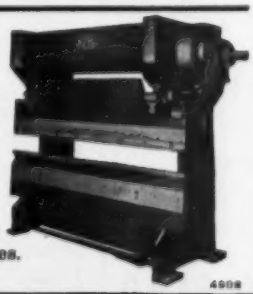
YOU DON'T HAVE TO LOOK FAR TO DISCOVER W. H. O. * IS TOPS IN THE PRECISION SCREW MACHINE PRODUCTS FIELD.

CAP SCREWS • COUPLING BOLTS, SET SCREWS • MILLED STUDS

*Wm. H. Ottemiller Co.
YORK, PENNA.

Ottemiller products are sold through Mill Supply Houses. Write for free folder and price information.

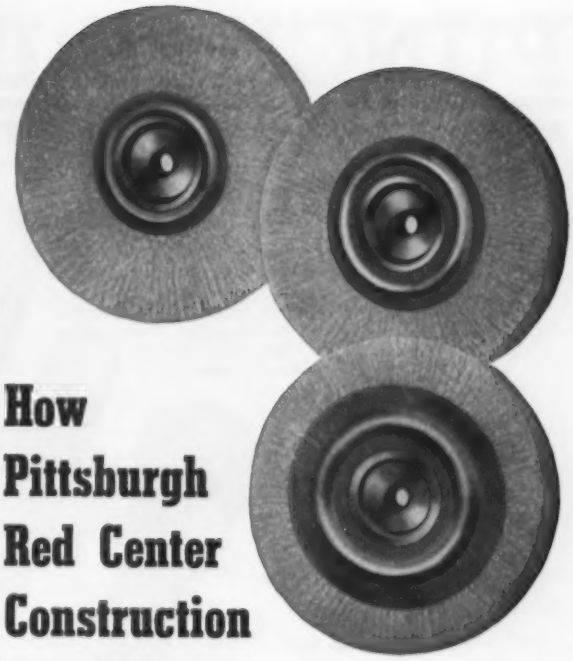
CHICAGO
STEEL
PRESS BRAKES
43 Standard Sizes



DIES Punching and Forming for All Makes and Sizes of Press Brakes.

4908

DREIS & KRUMP MANUFACTURING COMPANY
CHICAGO
7430 S. Loomis Blvd., Chicago 36, Illinois



How Pittsburgh Red Center Construction Provides

Faster cutting while maintaining smooth finish • Freedom from shedding • Perfect balance • Longer life

In conventional brushes, when faster cutting action is desired, coarser wire is used. But increasing the wire gauge causes brittleness, destroying the wearing quality of the brush, and resulting in excessive scoring of the work.

Pittsburgh has solved this problem by maintaining the same ideal gauge wire in every brush, but increasing the fill and diameter of the hub and center plate of brushes designed for faster cutting. Thus, although cutting speed is increased, work remains unscored and the wire does not lose its inherent power to flex. These Red Center brushes last longer, maintain perfect balance throughout life, and do a better job all around.

This is just one example of superior Pittsburgh construction, engineered for both general and specific applications. For details of the complete line, write for free Catalog #54-W. Address: PITTSBURGH PLATE GLASS CO., *Brush Div.*, Dept. N-6, 3221 Frederick Ave., Baltimore 29, Maryland.

PITTSBURGH
Power Driven BRUSHES
BRUSHES • PAINTS • GLASS • CHEMICALS • PLASTICS • FIBER GLASS
PITTSBURGH PLATE GLASS COMPANY
IN CANADA: CANADIAN PITTSBURGH INDUSTRIES LIMITED

PUNCHES·DIES

RIVET SETS · COMPRESSION RIVETER DIES

Made of highest standards and uniform quality thus insuring maximum service. **Since 1903**

Large inventory of stock sizes of round punches and dies, also rivet sets available for immediate shipment. Square, rectangular, oblong and elliptical shapes made to order.

Write Dept. B for New Catalog 54

GEO. F. MARCHANT COMPANY

1420-34 So. ROCKWELL STREET CHICAGO 8, ILLINOIS

PHOSPHATE COATING WITH GRANODRAW FACILITATES COLD FORMING OPERATIONS

The drawing of wire, bars, tubing, stampings, shells, shell cases, cold heading, and many other cold forming operations—including the cold extrusion of steel—are greatly facilitated by the application of a "Granodraw" zinc phosphate coating and a suitable lubricant prior to working.

Write for Descriptive Folder

AMERICAN CHEMICAL PAINT CO.

AMBLER, PA.

Detroit, Mich. Niles, Calif. Windsor, Ont.

Like to speed up your reading?

Turn to pages 2 and 3 of The Iron Age every week and let the

Digest of the Week in Metalworking

help you find your favorite features.

IT PAYS TO READ IRON AGE ADS TOO!

Heavy-duty sander-grinder

New 9-in. heavy-duty sander-grinder has more power than previous model, weighs 4 lb less. The tool is available in three different speeds and has a B & D built universal motor designed for continuous production duty. New type centrifugal fan pulls an increased amount of air through the

commutator section to provide a cool-running motor. The lower steel inspection plate acts as a rub-cover and seals the lower side of the tool from abrasive dust coming from the work surface. The sander-grinder has three speeds—4200, 5200 or 6000 rpm, and may be obtained with 115 v or 220 v universal motor. *Black & Decker Mfg. Co.*

For more data circle No. 40 on postcard, p. 97.

Checks machine alignment

Alignment of heavy machinery, aircraft jigs, transfer machines and other equipment is simplified with a new electric micrometer. The pre-

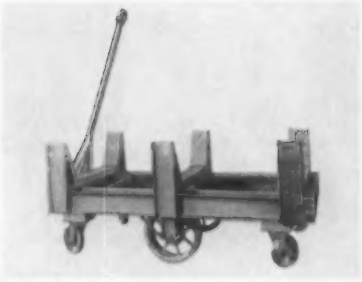
cision instrument was developed to provide a means for checking vertical alignment and lateral horizontal alignment over substantial distances. Fast and accurate readings within 0.0002 in. are possible and accuracies are said to be comparable to optical instruments. The instrument is compact and sturdy, built for long life and easy maintenance. *Ingersoll Milling Machine Co.*

For more data circle No. 41 on postcard, p. 97.

Permits heavy floor movement of bulk loads

Raw materials or finished products can be moved in bulk loads with this portable bar stock carrier. The all welded steel unit is composed basically of heavy channels with a heavy-duty tow bar welded to the base. It measures 4 ft wide x 8½ ft long. Two 12-in. diam rubber tired wheels and four castered and rubber tired smaller wheels provide easy maneuverability. All wheels are equipped with ball bearings. The bar stock carrier is produced in standard capacities of 5 to 10 tons; is available in other capacities ranging from 1 to 20 tons. *Rack Engineering Co.*

For more data circle No. 42 on postcard, p. 97.



Air comparator

The Stur-D-Aire amplifier, a new back pressure type air comparator, can be used with any type spindle or gaging fixture. Amplification can be varied to suit moderate production runs of precision parts or

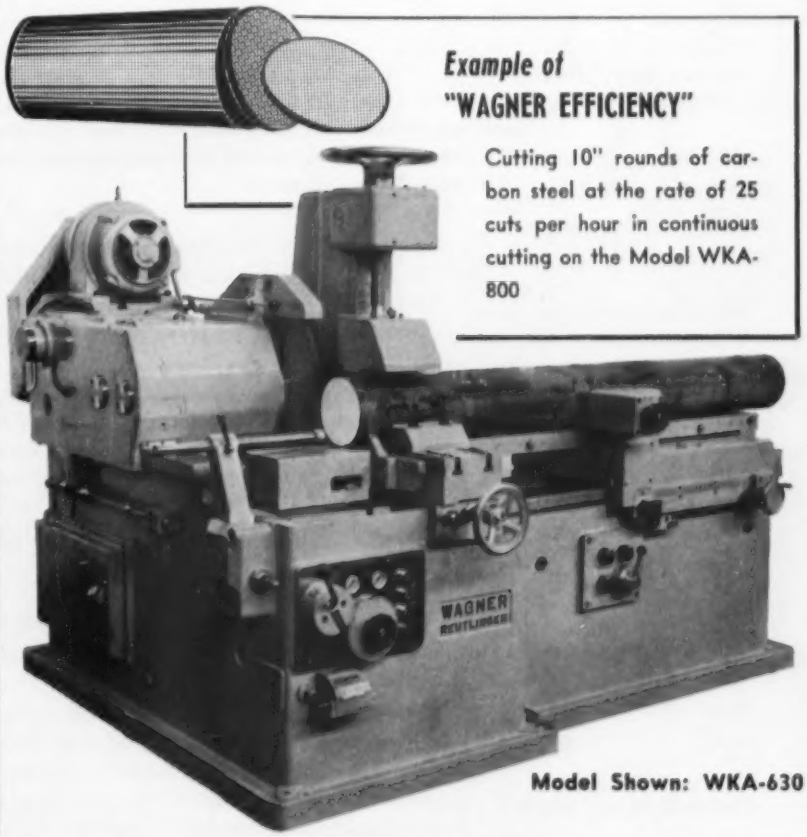
the instrument can be set to predetermined magnification with no change of parts. The Stur-D-Aire will combine with improved techniques for salvaging air gage spindles that make unnecessary the discarding of worn spindles. *Sturdy Tool & Gage Co.*

For more data circle No. 43 on postcard, p. 97.

Automated screw feeding

All hand-placing of fasteners is eliminated with new tool that feeds screws automatically and almost instantaneously from a hopper to a unique head that fits virtually any standard power screwdriver. Speed of screw fastening can be stepped up from 50 to 400 pct, it is stated. Screws pass in a split second from the hopper, holding enough screws for 5 to 8 hours' work, through a plastic hose to a special head mounted on a power screwdriver. The head grips screws in such a way that they may be driven at any angle, in any plane. *Pneuma-Serve, Inc.*

For more data circle No. 44 on postcard, p. 97.



Example of
"WAGNER EFFICIENCY"

Cutting 10" rounds of carbon steel at the rate of 25 cuts per hour in continuous cutting on the Model WKA-800

Model Shown: WKA-630

The New* ORIGINAL WAGNER *Automatic Hydraulic Cold Sawing Machines

Models WKA—the Heavy Duty, High Production Machine with its modern "MACHINE TOOL WAYS." Automatic models for capacities up to 12" rounds. Semi-Automatic models for capacities up to 27" rounds.

Exclusively Distributed By

KLINGELHOFER MACHINE TOOL COMPANY
INDUSTRIAL PARK, KENILWORTH, N. J.

having trouble getting steel?

In the face of high demand, some steel users are finding it difficult to get just what they need when they need it. If you are having trouble meeting current steel requirements we probably can help you. Here's why:

First, despite the fact that our own stocks have been hard hit in spots, we still have the world's largest inventories of carbon, alloy and stainless steel on hand—thousands of tons—and these stocks are being replenished daily.

Second, when local shortages do occur your nearby Ryerson plant can draw on stocks at fifteen other Ryerson plants and, in this way, can often take care of customers who would otherwise have to delay production or maintenance work.

Third, when the exact kind or size you need is not on hand, experienced Ryerson steel men can often supply a practical alternate from our large, diversified stocks. For example, heavy carbon steel plate, sheared into flat bars—or straight-chrome stainless to replace chrome-nickel types, etc.

And most important, you can depend on Ryerson to maintain positive control over the quality of your steel. In specifying, in handling, in cutting, first emphasis is always on quality under the Ryerson Certified Steel Plan. So whether or not you are having trouble getting steel, you will find our unequalled stocks, extensive facilities, and experienced organization are your most dependable source for help on steel problems.

RYERSON STEEL

In Stock: Carbon, Alloy and Stainless Steel; Bars, Structurals, Plates, Sheets, Tubing, etc.

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CHARLOTTE, N. C. • CINCINNATI • CLEVELAND DETROIT • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

The Iron Age SUMMARY . . .

Auto settlement removes hazard to steel boom . . . But steel labor talks will be that much tougher . . . Auto strikes won't affect steel market.

Steel Labor Next . . . The auto settlement removes one big hazard to the steel boom. But it also means that steel labor negotiations will be a lot tougher than expected. The United Steel Workers are on the scent of a healthy wage boost comparable to the best in its history.

Scattered strikes in automotive plants prior to the settlement were not enough to affect the steel market. The curtailments postponed but did not lessen automotive steel requirements.

Auto Producers Worried . . . In fact, the car producers are seriously worried over their steel needs for 1956 models. Their inventories are low and the model changeover will be completed with scarcely a halt in production. They are maintaining pressure on steel companies.

For one thing, the auto companies realize they are in a tough competitive race with one another and with other industries for a share of the available steel. Construction, linepipe, warehouses, and others are no shrinking violets when it comes to placing steel orders.

Big Fourth Quarter . . . As a result, it begins to look like fourth quarter steel production has a better than even change of hitting an all-time high. The 1953 record of 111.6 million tons for the year could easily be toppled. Third quarter will ease a little due to hot weather, vacations, and maintenance problems.

Steel labor talked softly but carried a big stick when it entered negotiations this week. The generous settlement in automotive on top of steel industry prosperity puts the union in its best bargaining position in years.

Wage Ideas Rise . . . Some industry leaders are privately revising their earlier estimates that the steel wage settlement would be around 10¢ an hour. The betting now is closer to 15¢. Steel negotiations are limited this year to wage rates.

Meanwhile, the pressure for more steel continues to mount. Incoming orders are still running in excess of capacity. Consumers generally are thinking in terms of fourth quarter. Third quarter is spoken for in most products, and some of this tonnage will spill over into the final period.

Holiday Slows Output . . . Steel production this week is estimated at 97 pct of capacity, up one-half point from last week, which was affected by the holiday.

Steel Output, Operating Rates

Production (Net tons, 000 omitted)	This Week† 2,340	Last Week 2,330	Month Ago 2,340	Year Ago 1,725
Ingot Index (1947–49=100)	145.5	145.0	145.5	107.4
Operating Rates				
Chicago	98.0	100.0	99.5	84.0
Pittsburgh	98.0	97.0*	99.0	70.0
Philadelphia	94.4	96.2	98.0	59.0
Valley	99.0	96.0*	98.0	69.0
West	100.6	102.0*	100.4	84.0
Detroit	92.0†	92.0*	92.0	95.0
Buffalo	105.0	105.0	105.0	67.5
Cleveland	103.8	104.0*	103.1	66.0
Birmingham	93.5	96.0	93.5	78.0
S. Ohio River	91.4	83.0*	92.7	86.0
Wheeling	97.0	95.0*	102.0	92.0
St. Louis	95.6	106.0*	106.1	72.5
Northeast	92.0	90.0	98.3	60.5
Aggregate	97.0	96.5*	97.0	72.5

*Revised. †Tentative

Prices At A Glance

(cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	4.797	4.797	4.797	4.634
Pig Iron (Gross ton)	$56.59	$56.59	$56.59	$56.59
Scrap, No. 1 hvy (gross ton)	$34.00	$34.00	$34.67	$28.25
Nonferrous				
Aluminum, ingot	23.20	23.20	23.20	21.50
Copper, electrolytic	36.00	36.00	36.00	30.00
Lead, St. Louis	14.80	14.80	14.80	14.05
Magnesium, ingot	29.25	29.25	29.25	27.75
Nickel, electrolytic	67.67	67.67	67.67	63.08
Tin, Straits, N. Y.	91.75	91.50	91.125	93.75
Zinc, E. St. Louis	12.00	12.00	12.00	11.00

Sheet Cutbacks Not Serious

Some automotive sheet "cancellations" are for minor adjustments . . . Order slack is picked up immediately . . . Plates, structurals lead product parade.

◆ DON'T TAKE too seriously reports of "cutbacks" in orders for sheets and manufacturers wire from the automotive industry. These "cutbacks" are nothing more than adjustments by the car producers to bring inventories into line as a preliminary to start of new model production.

Several steel producers have received inquiries from automotive purchasing agents regarding delivery promises for certain sizes and gages of sheets. If the producer cannot deliver on schedule, the order for that particular tonnage is cancelled.

The cancellations are described as "minor adjustments" by steel sales executives. Other consumers move in immediately to take up the material freed by the auto companies.

In some areas, plates are sold out for third quarter and are on a quota basis for fourth. Carryovers are running 30 days or more. The market is growing tighter.

While structurals are running slightly behind plate in demand, this market looks tight for the balance of the year. Wide-flange is sold for the year, but there may be some space available in fourth quarter for standard structurals.

Demand continues strong for bars, sheets, galvanized, tin plate, electrical steel, stainless, oil country goods and other tubular products. Strength in heavy products such as plates and structurals has increased competition for available ingots despite high production rates of steel melting furnaces.

PLATES . . . **Detroit** reports the plate market is still very tight with no letup in sight. In **Chicago** plate is through 3rd quarter and on a quota basis for 4th. Carryovers are running to 30 days and up. July carryover is expected to run 45 days and better. In **Pittsburgh** demand for plate far exceeds capacity. Current orders are being turned down while mills set up 4th quarter ordering procedures. In the **East** normal delivery pattern is late into 3rd quarter. Hard-pressed consumers are trying their best to fill limited tonnage needs wherever they can.

STRUCTURALS AND SHAPES . . . Wide-flange is through the year as far as new bookings go in **Chicago**. Some 4th quarter space is still available for standards. On the **West Coast** there are still some July openings for beams and angles. Most other items are booked into Sept. In **Pittsburgh** some limited tonnage has been booked for 4th quarter. Mills are waiting at the moment before booking 4th quarter business on a general scale. In the **East** deliveries are late into 3rd quarter with the books still closed on 4th quarter business.

PIPE AND TUBING . . . Seamless tubing in **Pittsburgh** is through 3rd quarter on the order books. In the **East**, one producer is through 3rd quarter for oil country pipe with seamless specialties into July. In **Chicago** tubular products are through 3rd quarter.

Purchasing Agent's Checklist

MARKETS: Purchasing agents face boom problems . . . . . p. 35

FINANCE: How-to-Invest Show brings Wall St. to Main St. . . p. 43

PRODUCTION: New computor solves machining problems . . . p. 44

MACHINE TOOLS: Test measures machine tool progress . . . . . p. 63

SHEETS AND STRIPS . . . In **Chicago**, cold-rolled, hot-rolled sheet and some strip are now quota items through 4th quarter. Galvanized sheet is out of sight for the rest of the year. Some producers are reported buying galvanized for their own fabricating subsidiaries. **Cleveland** consumers are finding deliveries of cold-rolled sheet running 4 weeks late on the average. Auto inventories are now running from 5 to 15 days with ordering expected to continue regardless of strike or model changes. Sheets and strip continue tight in **Pittsburgh**. New orders on the books are not exceeding capacity of the mills, however. In the **East** one producer reports delivery on electrolytic tin plate is into December. Hot-rolled, cold-rolled sheet and galvanized continue well into 3rd quarter with no orders yet being taken for 4th quarter.

BARS . . . **West Coast** mills are sold out for 3rd quarter bar orders. Automakers are taking a substantial part of this business. In the **East** and **Pittsburgh** hot-rolled and cold-drawn products are booked solidly through 3rd quarter. Alloy bars are at 10-12 weeks for one **eastern** producer, while **Pittsburgh** mills indicate it's impossible to completely satisfy customer tonnages on sizes 1½-in. and under. In **Chicago**, delivery carryovers have been extended two weeks to make deliveries about 30 days behind originally scheduled dates. Cold-finisher inventories of hot-rolled stock are low with some suppliers still being cut.

WIRE PRODUCTS . . . In **Cleveland** jobbers are getting merchant wire deliveries at 2-3 weeks. A step-up in ordering is looked for within the next month. Some mill time is still open for June. Manufacturers wire consumers can expect slightly better delivery as auto plants temporarily cut back orders in anticipation of model changeovers. **Chicago** reports manufacturers wire sold out for 3rd quarter. Merchant wire business is expected to pick up with a high level of buying foreseen for the year. In the **East** wire fabric delivery is well into 3rd quarter.

WAREHOUSES . . . In **Pittsburgh** business is reported to be the best in two years with plates and structurals leading the parade. Some weakness is noted in sheets. **Chicago** warehouses still report fair stocks of cut sheet, but mill customers are having trouble in that grade. Some consumers report fair stocks of coil.

Comparison of Prices

(Effective June 7, 1955)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

	June 7 1955	May 31 1955	May 10 1955	June 8 1954
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	4.05¢	4.05¢	4.05¢	3.925¢
Cold-rolled sheets	4.95	4.95	4.95	4.775
Galvanized sheets (10 ga.)	5.45	5.45	5.45	5.275
Hot-rolled strip	4.05	4.05	4.05	3.925
Cold-rolled strip	5.79	5.79	5.79	5.513
Plate	4.225	4.225	4.225	4.10
Plates wrought iron	9.30	9.30	9.30	9.30
Stainl's C-R strip (No. 302)	41.50	41.50	41.50	41.50
Tin and Ternplate: (per base box)				
Tinplate (1.50 lb.) cokes	$9.05	$9.05	$9.05	$8.95
Tinplate, electro (0.50 lb.)	7.75	7.75	7.75	7.65
Special coated mfg. terns	7.85	7.85	7.85	7.75
Bars and Shapes: (per pound)				
Merchant bars	4.30¢	4.30¢	4.30¢	4.16¢
Cold-finished bars	5.40	5.40	5.40	5.22
Alloy bars	5.075	5.075	5.075	4.875
Structural shapes	4.25	4.25	4.25	4.10
Stainless bars (No. 302)	35.50	35.50	35.50	35.50
Wrought iron bars	10.40	10.40	10.40	10.40
Wire: (per pound)				
Bright wire	5.75¢	5.75¢	5.75¢	5.525¢
Rails: (per 100 lb.)				
Heavy rails	$4.45	$4.45	$4.45	$4.325
Light rails	5.35	5.35	5.35	5.20
Semifinished Steel: (per net ton)				
Rerolling billets	$64.00	$64.00	$64.00	$62.00
Slabs, rerolling	64.00	64.00	64.00	62.00
Forging billets	78.00	78.00	78.00	75.50
Alloy blooms, billets, slabs	86.00	86.00	86.00	82.00
Wire Rod and Skelp: (per pound)				
Wire rods	4.675¢	4.675¢	4.675¢	4.525¢
Skelp	3.90	3.90	3.90	3.75
Finished Steel Composite: (per pound)				
Base price	4.797¢	4.797¢	4.797¢	4.634¢

	June 7 1955	May 31 1955	May 10 1955	June 8 1954
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$61.19	$61.19	$61.19	$61.19
Foundry, Valley	56.50	56.50	56.50	56.50
Foundry, Southern, Cin'ti	60.43	60.43	60.43	60.43
Foundry, Birmingham	52.88	52.88	52.88	52.88
Foundry, Chicago	56.50	56.50	56.50	56.50
Basic, del'd Philadelphia	60.27	60.27	60.27	60.27
Basic, Valley furnace	56.00	56.00	56.00	56.00
Malleable, Chicago	56.50	56.50	56.50	56.50
Malleable, Valley	56.50	56.50	56.50	56.50
Ferromanganese‡, cents per lb.	9.50¢	9.50¢	9.50¢	10.00¢
‡ 74-76 pct Mn base.				
Pig Iron Composite: (per gross ton)				
Pig iron	$56.59	$56.59	$56.59	$56.59
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$34.50	$34.50	$34.50	$29.50
No. 1 steel, Phila. area	35.00	35.00	36.00	22.75
No. 1 steel, Chicago	32.50	32.50	33.50	32.50
No. 1 bundles, Detroit	27.00	27.00	27.00	26.00
Low phos., Youngstown	35.50	35.50	35.50	31.50
No. 1 mach'y cast, Pittsburgh	43.50	43.50	43.50	43.50
No. 1 mach'y cast, Philadel'a.	*43.50*	44.50	44.50	39.50
No. 1 mach'y cast, Chicago	45.50	44.50	46.50	41.00
Steel Scrap Composite: (per gross ton)				
No. 1 heavy melting scrap	$34.00	$34.00	$34.67	$28.25
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$13.25	$13.25	$13.00	$14.38
Foundry coke, prompt	16.25	16.25	16.75	16.75
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	36.00	36.00	36.00	30.00
Copper, Lake, Conn.	36.00	36.00	36.00	30.00
Tin, Straits, New York	91.75†	91.50	91.125	93.75
Zinc, East St. Louis	12.00	12.00	12.00	11.00
Lead, St. Louis	14.80	14.80	14.80	14.05
Aluminum, virgin ingot	23.20	23.20	23.20	21.50
Nickel, electrolytic	67.67	67.67	67.67	63.08
Magnesium, ingot	29.25	29.25	29.25	27.75
Antimony, Laredo, Tex.	28.50	28.50	28.50	28.50
† Tentative. ‡ Average. * Revised.				

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

←To identify producers, see Key on P. 143→

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Bethlehem *B3*	$58.00	$58.50	$59.00	$59.50	.....
Birdsboro, Pa. *B6*	58.00	58.50	59.00	59.50	.....
Birmingham *R3*	52.38	52.88	.....	.....	.....
Birmingham *W9*	52.38	52.88	.....	.....	.....
Birmingham *U4*	52.38	52.88	56.50	.....	.....
Buffalo *R3*	56.00	56.50	57.00	.....	.....
Buffalo *I11*	56.00	56.50	57.00	.....	.....
Buffalo *W6*	56.00	56.50	57.00	57.50	.....
Chicago *I4*	56.00	56.50	56.50	57.00	.....
Cleveland *A5*	56.00	56.50	56.50	57.00	61.00
Cleveland *R3*	56.00	56.50	56.50	.....	.....
Daingerfield *L3*	52.50	52.50	52.50	.....	.....
Duluth *I4*	56.00	56.50	56.50	57.00	.....
Erie *I4*	56.00	56.50	56.50	57.00	.....
Everett *M6*	.....	61.00	61.50	.....	.....
Fontana *K1*	62.00	62.50	.....	.....	.....
Geneva, Utah *C7*	56.00	56.50	.....	.....	.....
Granite City *G2*	57.90	58.40	58.90	.....	.....
Hubbard *Y1*	.....	.....	56.50	.....	.....
Minnequa *C6*	56.00	59.00	59.00	.....	.....
Monessen *P6*	56.00	.....	.....	.....	.....
Neville Is. *P4*	56.00	56.50	56.50	.....	.....
N. Tonawanda *T1*	.....	56.50	57.00	.....	.....
Pittsburgh *U1*	56.00	.....	.....	57.00	.....
Sharpsville *S3*	56.00	56.50	56.50	57.00	.....
So. Chicago *R3*	56.00	.....	56.50	.....	.....
Steelton *B3*	58.00	58.50	59.00	59.50	64.00
Swedeland *A2*	58.00	58.50	59.00	59.50	.....
Toledo *I4*	56.00	56.50	56.50	57.00	.....
Troy, N. Y. *R3*	58.00	58.50	59.00	59.50	64.00
Youngstown *V1*	.....	.....	56.50	57.00	.....

DIFFERENTIALS: Add 50¢ per ton for each 0.25 pct silicon over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.50 pct manganese over 1 pct, $2 per ton for 0.5 to 0.75 pct nickel, $1 for each additional, 0.25 pct nickel. Subtract 38¢ per ton for phosphorus content 0.70 and over.

Silvery Iron: Buffalo, *H1*, $66.25; Jackson, *J1, G1*, $65.00. Add $1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. Add $1 per ton for 0.75 pct or more phosphorus. Add 75¢ for each 0.50 pct manganese over 1.0 pct. Bessemer ferrosilicon prices are $1 over comparable silvery iron.

STAINLESS STEEL

Base price cents per lb. f.o.b. mill

Product	301	302	303	304	316	321	347 Cb	410	416	430
Ingots, rerolling	16.75	17.75	19.25	19.00	29.75	23.50	35.50	14.00	—	14.25
Slabs, billets, rerolling	21.00	23.25	25.25	24.50	38.00	30.25	46.75	18.25	—	18.5
Forg. discs, die blocks, rings	39.00	39.00	42.00	41.25	61.75	46.25	—	31.00	31.75	41.7
Billets, forging	30.00	30.25	32.75	31.75	48.25	36.00	54.75	24.00	24.50	24.5
Bars, wires, structurals	35.75	36.00	38.75	38.00	57.25	42.75	64.25	28.75	29.25	29.2
Plates	37.75	38.00	40.25	40.50	60.50	46.50	69.25	30.00	30.50	30.5
Sheets	41.75	42.00	49.25	44.50	64.50	51.25	77.50	34.25	41.25	34.7
Strip, hot-rolled	30.25	32.50	37.25	35.00	55.00	41.75	63.00	26.25	—	27.0
Strip, cold-rolled	38.75	42.00	46.00	44.50	64.50-64.75	51.25-51.50	77.50	34.25	41.25	34.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11*; Brackenridge, Pa., *A3*; Butler, Pa., *A7*; McKeesport, Pa., *U1*; Washington, Pa., *W2, J2*; Baltimore, *E1*; Middletown, O., *A7*; Massillon, O., *R3*; Gary, *U1*; Bridgeville, Pa., *U2*; New Castle, Ind., *I2*; Ft. Wayne, *J4*; Philadelphia, *D5*.

Strip: Midland, Pa., *C11*; Cleveland, *A5*; Carnegie, Pa., *S9*; McKeesport, Pa., *F1*; Reading, Pa., *C2*; Washington, Pa., *W2*; W. Leechburg, Pa., *A3*; Bridgeville, Pa., *U2*; Detroit, *M2*; Canton-Massillon, O., *R3*; Middletown, O., *A7*; Harrison, N. J., *D3*; Youngstown, *C5*; Sharon, Pa., *S1*; Butler, Pa., *A7*; Wallingford, Conn., *U3* (.25¢ per lb higher) *W1* (.25¢ per lb higher); New Bedford, Mass., *R6*.

Bar: Baltimore, *A7*; Duquesne, Pa., *U1*; Munhall, Pa., *U1*; Reading, Pa., *C2*; Titusville, Pa., *U2*; Washington, Pa., *J2*; McKeesport, Pa., *U1, F1*; Bridgeville, Pa., *U2*; Dunkirk, N. Y., *A3*; Massillon, O., *R3*; Chicago, *U1*; Syracuse, N. Y., *C11*; Watervliet, N. Y., *A3*; Waukegan, *A5*; Canton, O., *T5*; Ft. Wayne, *I4*; Philadelphia, *D5*.

Wire: Waukegan, *A5*; Massillon, O., *R3*; McKeesport, Pa., *F1*; Ft. Wayne, *J4*; Harrison, N. J., *D3*; Baltimore, *A7*; Dunkirk, *A3*; Monessen, *P1*; Syracuse, *C11*; Bridgeville, *U2*.

Structurals: Baltimore, *A7*; Massillon, O., *R3*; Chicago, Ill., *J4*; Watervliet, N. Y., *A3*; Syracuse, *C11*.

Plates: Brackenridge, Pa., *A3*; Chicago, *U1*; Munhall, Pa., *U1*; Midland, Pa., *C11*; New Castle, Ind., *I2*; Middletown, *A7*; Washington, Pa., *J2*; Cleveland, Massillon, *R3*; Coatesville, Pa., *C15*; Philadelphia, *D5*.

Forged discs, die blocks, rings: Pittsburgh, *C11*; Syracuse, *C11*; Ferndale, Mich., *A3*; Washington, Pa., *J2*.

Forgings billets: Midland, Pa., *C11*; Baltimore, *A7*; Washington, Pa., *J2*; McKeesport, *F1*; Massillon, Canton, O., *R3*; Watervliet, *A3*; Pittsburgh, Chicago, *U1*; Syracuse, *C11*.

Market Shows New Strength

Chicago prices break upward on buying wave . . . East looks for rally to follow strike threat end . . . Prices hold in active Pittsburgh market.

◆ THE MARKET definitely had a firmer tone this week with Chicago looking particularly healthy.

Pressure for an upswing had been mounting for several weeks in Chicago and finally broke loose. Large scale buying increased or strengthened prices and swept away distress sale figures. New sales of No. 1 dealer bundles at $34 showed the market had moved past the leveling off stage and was rebounding.

Elsewhere things were quieter but there were signs of gathering strength. Scattered buys sent foundry grade prices both up and down in the East, where dealers felt buying would step up and prices rally when the dust clears from strike negotiations.

In Pittsburgh new buys strengthened current prices of steelmaking grades and period of steady prices seemed in progress.

For the second straight week, THE IRON AGE Composite for No. 1 heavy melting steel held at $34.00, indicating the price slide has been halted.

Pittsburgh . . . Scrap market seems to be moving sideways. It is generally felt the price for openhearth grades has reached bottom, but will be quite a while before it starts up again. A large independent mill has purchased a sizable tonnage of openhearth scrap at current prices for June and July delivery. Another large consumer is reported to have extended delivery dates on latest orders into July. Blast furnace grades are unchanged with latest transactions confirming IRON AGE prices.

Chicago . . . Chicago scrap, after a severe beating in the past 3 weeks, began finally to rebound after giving evidence of firming over the past 10 days to 2 weeks. A sale of No. 2 heavy melting at $29 firmed the No. 2 heavy melting grade after attempts to buy at $28 brought in relatively limited tonnages. Further purchases of No. 1 factory bundles at $36 as well as buying of No. 2 bundles recently at $24 were indicators of the basic strength that had been developing in the market over the past 10 days.

Philadelphia . . . In the face of a generally quiet market in which individual grades show both ups and downs, price of No. 1 heavy melting is holding at $35.50 tops. No. 2 heavy melting price is up $1 on the bottomside against last week's listing. Among grades showing a drop are heavy turnings, down $1.50 on the topside, while cupola cast is off $2 against last week's top price. Dealers report bundles for export are down $1-$2. With the air now cleared on the automotive scene, greater strength is looked for in the buying picture. Belief is that price readjustments in most grades have neared the downward limit.

New York . . . Market in this area was on the quiet side as one source reported a squeeze developing at the local buying level. Resistance of dealers to lowered prices is said to be making it difficult for brokers to cover mill orders. Another report had it that mills were looking for another $2 off on steelmaking grades and that export prices had followed the domestic drop. Price action was confined to No. 1 machinery cast, which was off $2, and heavy breakable cast, which jumped $2.

Detroit . . . Although a local mill made a buy of No. 1 heavy melting scrap at no change in price last week, there are still no sure signs that the market is leveling off. The same mill bought No. 2 bundles on an $18.50 FOB basis. No other buying activity has been reported and dealers predict that the market will be off another $1 when the automotive lists come out for July.

Cleveland . . . Brokers covering Valley markets were warned by a major scrap consumer last week that restricted shipments must originate in industrial plants or face contract cancellation. Mills complaint is high alloy content, approaching maximum allowable, and warnings are attempt to improve quality of incoming scrap from a few dealers.

Birmingham . . . Scrap buying in this district is limited and the market appears dull, with prices of several items lower. Cast prices, however, remain steady although foundry purchases are limited. Dealers report depressed prices and a dropoff of intake due to summer weather that is keeping farmers in the field.

St. Louis . . . The steel operating rate dropped during the Memorial holiday and is now down to 95.6, which is considered reasonably high. June shipments will continue at the present price level and mills are receiving sufficient scrap to meet the melt from local points.

Cincinnati . . . The major local consumer came into the market last week for a larger than normal purchase. Price for No. 1 heavy melting was $33.50 delivered, or $1 less than prevailing market. No. 1 bundles, however, were purchased at the prevailing price of $34.50, making it $1 over the heavy melting grade. A major out-of-area consumer also came into the market for its regular purchase at $1 under the market for No. 1 heavy melting.

Buffalo . . . The market continues weak in this area with limited action bringing price losses. No. 2 steelmaking grades were off 50¢. Machine shop turnings dropped $1.

Boston . . . Market continues dull in this area and most steelmaking grades were off 50¢. The story is the same: Pittsburgh buyers are out of the market; eastern Pennsylvania mills are doing little buying; export is slack.

West Coast . . . Mill inventories in good shape as all mills continue operating over 100 pct of rated capacity. One Los Angeles mill says it's not buying in June. Prices are steady in face of heavy exports.

Luria Brothers and Company, Inc.

MAIN OFFICE

LINCOLN-LIBERTY BLDG.

Philadelphia 7, Penna.

PLANTS

LEBANON, PENNA. DETROIT (ECORSE), MICHIGAN
READING, PENNA. PITTSBURGH, PENNA.
MODENA, PENNA. ERIE, PENNA.

OFFICES

BIRMINGHAM, ALA.	DETROIT, MICHIGAN	PITTSBURGH, PENNA.
BOSTON, MASS.	HOUSTON, TEXAS	PUEBLO, COLORADO
BUFFALO, N. Y.	LEBANON, PENNA.	READING, PENNA.
CHICAGO, ILLINOIS	LOS ANGELES, CAL.	ST. LOUIS, MO.
CLEVELAND, OHIO	NEW YORK, N. Y.	SAN FRANCISCO, CAL.
	SEATTLE, WASH.	

Scrap Prices *(Effective June 7, 1955)*

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$34.00 to $35.00
No. 2 hvy. melting	31.00 to 32.00
No. 1 bundles	34.00 to 35.00
No. 2 bundles	26.00 to 27.00
Machine shop turn.	20.50 to 21.50
Mixed bor. and ms. turns.	20.50 to 21.50
Shoveling turnings	24.50 to 25.50
Cast iron borings	24.50 to 25.50
Low phos. punch'gs, plate	37.00 to 38.00
Heavy turnings	32.00 to 33.00
No. 1 RR. hvy. melting	36.50 to 37.50
Scrap rails, random lgth.	44.00 to 45.00
Rails 2 ft and under	50.00 to 51.00
RR. steel wheels	42.50 to 43.50
RR. spring steel	42.50 to 43.50
RR. couplers and knuckles	42.50 to 43.50
No. 1 machinery cast.	43.00 to 44.00
Cupola cast.	39.00 to 40.00
Heavy breakable cast.	34.00 to 35.00

Chicago

No. 1 hvy. melting	$32.00 to $33.00
No. 2 hvy. melting	28.00 to 29.00
No. 1 factory bundles	35.00 to 36.00
No. 1 dealers' bundles	33.00 to 34.00
No. 2 dealers' bundles	23.00 to 24.00
Machine shop turn.	17.00 to 18.00
Mixed bor. and turn.	19.00 to 20.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	19.00 to 20.00
Low phos. forge crops	39.00 to 40.00
Low phos. punch'gs, plate	37.00 to 38.00
Low phos. 2 ft and under	36.00 to 37.00
No. 1 RR. hvy. melting	36.00 to 37.00
Scrap rails, random lgth.	43.00 to 44.00
Rerolling rails	51.00 to 52.00
Rails 2 ft and under	48.00 to 49.00
Locomotive tires, cut	35.00 to 36.00
Cut bolsters & side frames	37.00 to 39.00
Angles and splice bars	43.00 to 45.00
RR. steel car axles	42.00 to 43.00
RR. couplers and knuckles	41.00 to 42.00
No. 1 machinery cast.	45.00 to 46.00
Cupola cast.	41.00 to 42.00
Heavy breakable cast.	32.00 to 33.50
Cast iron brake shoes	33.00 to 34.00
Cast iron car wheels	37.00 to 38.00
Malleable	45.00 to 46.00
Stove plate	33.00 to 34.00

Philadelphia Area

No. 1 hvy. melting	$34.50 to $35.50
No. 2 hvy. melting	31.50 to 32.50
No. 1 bundles	34.50 to 35.50
No. 2 bundles	26.00 to 28.00
Machine shop turn.	20.50 to 21.50
Mixed bor. short turn.	20.50 to 21.50
Cast iron borings	20.50 to 21.50
Shoveling turnings	23.00 to 24.00
Clean cast chem. borings	27.00 to 28.00
Low phos. 5 ft and under	38.50 to 39.50
Low phos. 2 ft and under	40.00 to 41.00
Low phos. punch'gs	40.00 to 41.00
Elec. furnace bundles	37.50 to 38.50
Heavy turnings	32.50 to 33.50
RR. steel wheels	40.00 to 41.00
RR. spring steel	40.00 to 41.00
Rails 18 in. and under	50.00 to 51.00
Cupola cast.	35.00 to 36.00
Heavy breakable cast.	40.00 to 41.00
Cast iron car wheels	44.00 to 45.00
Malleable	44.00 to 45.00
Unstripped motor blocks	27.00 to 28.00
No. 1 machinery cast.	43.00 to 44.00
Charging box cast.	37.00 to 38.00

Cleveland

No. 1 hvy. melting	$31.50 to $32.50
No. 2 hvy. melting	26.00 to 27.00
No. 1 bundles	31.50 to 32.50
No. 2 bundles	23.00 to 24.00
No. 1 busheling	31.50 to 32.50
Machine shop turn.	17.00 to 18.00
Mixed bor. and turn.	22.00 to 23.00
Shoveling turnings	22.00 to 23.00
Cast iron borings	22.00 to 23.00
Cut struct'r'l & plates, 2 ft & under	39.00 to 40.00
Drop forge flashings	31.00 to 32.00
Low phos. punch'gs, plate	32.50 to 33.50
Foundry steel, 2 ft & under	38.00 to 39.00
No. 1 RR. heavy melting	35.00 to 36.00
Rails 2 ft and under	48.00 to 49.00
Rails 18 in. and under	49.00 to 50.00
Railroad grate bars	26.00 to 27.00
Steel axle turnings	26.00 to 27.00
Railroad cast.	44.00 to 45.00
No. 1 machinery cast.	44.00 to 45.00
Stove plate	43.00 to 44.00
Malleable	44.00 to 45.00

Youngstown

No. 1 hvy. melting	$34.00 to $35.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 bundles	34.00 to 35.00
No. 2 bundles	25.00 to 26.00
Machine shop turn.	18.50 to 19.50
Shoveling turnings	24.50 to 25.50
Cast iron borings	24.50 to 25.50
Low phos. plate	35.00 to 36.00

Buffalo

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	24.50 to 25.50
No. 1 busheling	29.00 to 30.00
No. 1 bundles	29.00 to 30.00
No. 2 bundles	22.50 to 23.50
Machine shop turn.	18.00 to 19.00
Mixed bor. and turn.	20.50 to 21.50
Shoveling turnings	21.50 to 22.50
Cast iron borings	20.50 to 21.50
Low phos. plate	32.00 to 33.00
Scrap rails, random lgth.	35.00 to 36.00
Rails 2 ft and under	42.00 to 43.00
RR. steel wheels	36.00 to 37.00
RR. spring steel	36.00 to 37.00
RR. couplers and knuckles	36.00 to 37.00
No. 1 machinery cast.	40.00 to 41.00
No. 1 cupola cast.	36.00 to 37.00

Detroit

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$26.50 to $27.50
No. 2 hvy. melting	21.00 to 22.00
No. 1 bundles, openhearth	26.50 to 27.50
No. 2 bundles	17.50 to 18.50
New busheling	26.50 to 27.50
Drop forge flashings	26.00 to 27.00
Machine shop turn.	12.00 to 13.00
Mixed bor. and turn.	14.50 to 15.50
Shoveling turnings	15.50 to 16.50
Cast iron borings	15.50 to 16.50
Low phos. punch'gs, plate	27.50 to 28.50
No. 1 cupola cast.	35.00 to 37.00
Heavy breakable cast.	27.00 to 28.00
Stove plate	31.00 to 32.00
Automotive cast.	40.00 to 41.00

St. Louis

No. 1 hvy. melting	$30.00 to $31.00
No. 2 hvy. melting	28.00 to 29.00
No. 1 bundles	30.00 to 31.00
No. 2 bundles	23.50 to 24.50
Machine shop turn.	14.50 to 15.50
Cast iron borings	16.50 to 17.50
Shoveling turnings	16.50 to 17.50
No. 1 RR. hvy. melting	35.00 to 36.00
Rails, random lengths	39.00 to 40.00
Rails, 18 in. and under	47.00 to 48.00
Locomotive, tires uncut	36.50 to 37.50
Angles and splice bars	36.50 to 37.50
Std. steel car axles	36.00 to 37.00
RR. spring steel	37.00 to 38.00
Cupola cast.	42.00 to 43.00
Hvy. breakable cast.	34.00 to 35.00
Cast iron brake shoes	32.00 to 33.00
Stove plate	35.00 to 36.00
Cast iron car wheels	35.00 to 36.00
Malleable	35.00 to 36.00
Unstripped motor blocks	33.50 to 34.50

Boston

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$25.50 to $26.50
No. 2 hvy. melting	20.50 to 21.50
No. 1 bundles	25.50 to 26.50
No. 2 bundles	18.00 to 19.00
No. 1 busheling	25.50 to 26.50
Elec. furnace, 2 ft & under	31.00 to 32.00
Machine shop turn.	10.00 to 11.00
Mixed bor. and short turn.	13.00 to 14.00
Shoveling turnings	14.00 to 15.00
Clean cast chem. borings	15.00 to 16.00
No. 1 machinery cast.	31.00 to 32.00
Mixed cupola cast.	29.00 to 30.00
Heavy breakable cast.	27.00 to 28.00
Stove plate	27.00 to 28.00
Unstripped motor blocks	17.00 to 18.00

New York

Brokers buying prices per gross ton, on ca:

No. 1 hvy. melting	$30.50
No. 2 hvy. melting	27.00
No. 2 bundles	$22.00 to 23.00
Machine shop turn.	10.50 to 11.50
Mixed bor. and turn.	11.50 to 12.50
Shoveling turnings	13.50 to 14.50
Clean cast. chem. borings	20.00 to 21.00
No. 1 machinery cast.	35.00 to 37.00
Mixed yard cast.	31.00 to 32.00
Charging box cast.	31.00 to 32.00
Heavy breakable cast.	33.00 to 34.00
Unstripped motor blocks	22.00 to 23.00

Birmingham

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 bundles	29.00 to 30.00
No. 2 bundles	18.00 to 19.00
No. 1 busheling	29.00 to 30.00
Machine shop turn.	17.00 to 18.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	15.00 to 16.00
Electric furnace bundles	31.00 to 32.00
Bar crops and plate	36.00 to 37.00
Structural and plate, 2 ft	36.00 to 37.00
No. 1 RR. hvy. melting	35.00 to 36.00
Scrap rails, random lgth.	40.00 to 41.00
Rails, 18 in. and under	45.00 to 46.00
Angles & splice bars	43.00 to 44.00
Shoveling turnings	22.00 to 23.00
No. 1 cupola cast.	45.00 to 46.00
Stove plate	42.00 to 43.00
Charging box cast.	22.00 to 23.00
Cast iron car wheels	33.00 to 34.00
Unstripped motor blocks	34.50 to 35.50
Mashed tin cans	15.00 to 16.00

Cincinnati

Brokers buying prices per gross ton, on cars

No. 1 hvy. melting	$30.50 to $31.50
No. 2 hvy. melting	27.50 to 28.50
No. 1 bundles	31.50 to 32.50
No. 2 bundles	21.50 to 22.50
Machine shop turn.	18.00 to 19.00
Mixed bor. and turn.	17.50 to 18.50
Shoveling turnings	22.00 to 23.00
Cast iron borings	17.50 to 18.50
Low phos., 18 in. & under	37.00 to 38.00
Rails, random lengths	41.00 to 42.00
Rails, 18 in. and under	47.00 to 48.00
No. 1 cupola cast.	40.00 to 41.00
Hvy. breakable cast.	34.00 to 35.00
Drop broken cast.	44.00 to 45.00

San Francisco

No. 1 hvy. melting	$30.00
No. 2 hvy. melting	28.00
No. 1 bundles	29.00
No. 2 bundles	25.00
No. 3 bundles	21.00
Machine shop turn.	10.00
Cast iron borings	9.00
No. 1 RR. hvy. melting	30.00
No. 1 cupola cast.	40.00

Los Angeles

No. 1 hvy. melting	$30.00
No. 2 hvy. melting	28.00
No. 1 bundles	29.00
No. 2 bundles	23.00
No. 3 bundles	20.00
Machine shop turn.	8.00
Shoveling turnings	10.00
Cast iron borings	10.00
Elec. furn. 1 ft. and under	30.00
No. 1 RR. hvy. melting	30.00
No. 1 cupola cast.	$41.00 to 42.00

Seattle

No. 1 hvy. melting	$33.00
No. 2 hvy. melting	29.00
No. 2 bundles	23.00
No. 3 bundles	19.00
No. 1 cupola cast.	35.00
Mixed yard cast.	35.00

Hamilton, Ont.

No. 1 hvy. melting	$34.00
No. 2 hvy. melting	31.00
No. 1 bundles	34.00
No. 2 bundles	28.00
Mixed steel scrap	28.00
Bushelings	29.00
Bush., new fact prep'd	32.00
Bush., new fact unprep'd	28.00
Machine shop turn	16.00
Short steel turnings	21.00
Mixed bor. and turn.	$16.00 to 17.00
Rails, rerolling	43.00
Cast scrap	43.00 to 45.00

for lower maintenance

it's ohio magnets

Ohio Magnets cost less to maintain because they're built with an extra margin of safety. So for extra magnet life, extra magnet value—always specify Ohio Magnets and Ohio Magnet Controllers. There's a type and size for every lifting job. Send for free copy of Bulletin 112, or consult the Yellow Pages for Ohio offices in principal cities. AA-1476

THE OHIO ELECTRIC MFG. CO.
5400 DUNHAM ROAD • MAPLE HEIGHTS
CLEVELAND, OHIO

Ohio Also Makes Separation Magnets • Nail Making Machines • Fractional Horsepower Shell and Torque Motors

Auto Peace Heats Markets

Stepped up demand seen for most nonferrous metals as a result of auto settlement . . . Buyers had been holding off during talks, now will increase orders . . . Pressure on zinc price.

◆ STEPPED UP DEMAND and possible price increases—particularly for zinc—were strong possibilities following peaceful settlement of auto labor negotiations early this week.

While the Ford-United Autoworker confabs were still going on, nonferrous metals buyers for the most part played it cagey. Aluminum smelters, for example, reported that although some July business came in, many buyers had been holding off in the belief that if there were a prolonged auto strike, they would be able to build up depleted stocks at markedly lower prices.

But now that the auto negotiations have been settled peacefully, the hanging back period will have to be made up. This means increased demand for metals that are already in tight supply.

And with signs that strain on zinc had reached a point where a price increase seemed imminent, the auto settlement only served to add more pressure, as it is likely a pick up in orders for zinc will result.

Importance of the impact of automotive buying on nonferrous metals markets can't be overtimated. For example Alcoa estimates around 30 lb of aluminum are used on the average '55 auto. Rough estimates for other metals used in a typical 4-door sedan shape up like this: Lead, 30 lb; copper, 42 lb; zinc, 86 lb; tin, 1 lb; chromium, molybdenum and nickel, 7 lb; manganese, 19 lb.

Multiply these figures by estimated '55 auto production of around 6.5 million and the totals for the automotive industry's nonferrous metals consumption are extremely impressive.

Nonferrous metals came in for considerable attention at the National Assn. of Purchasing Agents' annual meeting in New York last week. A special nonferrous metals forum was held at which industry leaders generally agreed that shortages of leading nonferrous metals would continue throughout '55. Here's the picture they gave:

Aluminum . . . civilian demand far in excess of forecasts. Demand cannot be met unless stockpile take is reduced, scrap exports are further restricted or a third round aluminum expansion program is started.

Nickel . . . supply shows no improvement. Reason for this is that defense rated orders placed by producers of nickel-bearing products have increased considerably beyond government predictions. Indications are that while stockpiling will continue, the amount the government takes will be reduced.

Copper . . . in spite of increased production, copper scarcity will continue to the end of the year. Even if the U. S. business pace slows, copper will still be tight because metal is needed for inventory rebuilding and because of the copper owed to the government stockpile.

Lead . . . supply is sufficient to take care of demand. Price appears stable at 15¢ per lb level.

Zinc . . . enough to meet all requirements, except Special High Grade is tight.

Copper . . . there will be a strong price market for brass and bronze for some time. Price of copper at 36¢ per lb is too high and other metals may be used as substitutes if the price doesn't come down.

(For complete report on purchasing agents' meeting see p. 35.)

Daily Nonferrous Metal Prices

(Cents per lb except as noted)

	June 1	June 2	June 3	June 4	June 6	June 7
Copper, electro, Conn.	36.00	36.00	36.00	36.00	36.00	36.00
Copper, Lake, delivered	36.00	36.00	36.00	36.00	36.00	36.00
Tin, Straits, New York	91.625	91.875	91.75	....	91.75	91.75*
Zinc, East St. Louis	12.00	12.00	12.00	12.00	12.00	12.00
Lead, St. Louis	14.80	14.80	12.00	14.80	14.80	14.80

Note: Quotations are going prices **Tentative*

Monthly Average Metal Prices

(Cents per lb except as noted)

Average prices of the major nonferrous metals in April based on quotations appearing in THE IRON AGE, were as follows:

Electrolytic copper,		Zinc, E. St. Louis	12.00
Del'd Conn. Valley	36.00	Zinc, New York	12.50
Lake copper, delivered	36.00	Lead, St. Louis	14.80
Straits tin, New York	91.369	Lead, New York	15.00

TIN . . . Tin consumption by U. S. industries during the first 3 months of 1955 was up almost 11 pct over same period in 1954. Total consumption in the first quarter amounted to 14,430 long tons, 1420 tons more than in first quarter '54. Tinplate manufacturers took 8125 tons, 6 pct more than a year ago and solder manufacturers used 2584 tons, an 18 pct increase over last year.

TITANIUM . . . ODM has granted fast tax aid to Columbia-Southern Chemical Corp., Natrium, W. Va., for titanium tetrachloride for production facilities. Ninety pct of the $5.5 million cost is eligible for fast tax privileges.

Nonferrous Prices *(Effective June 7, 1955)*

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

Alloy	Flat Sheet		Plate	
	0.032 in.	0.081 in.	0.136-0.249 in.	0.250-3.000 in.
1100, 3003	39.1	37.1	35.9	35.5
3004	44.0	39.8	38.1	37.6
5052	46.7	41.9	40.2	39.3
2024-O, -OAL	49.4	40.8	39.3	39.4
7075-O, -OAL	60.8	49.1	46.8	46.8

Extruded Solid Shapes: Shape factors 1 to 6, 38.7¢ to 86.7¢; 12 to 14, 39.4¢ to $1.04; 24 to 26, 42.2¢ to $1.35; 36 to 38, 49.8¢ to $1.97.

Rod, Round: Rolled, 1.064-4-5 in. 1100-F, 48.6¢ to 40.1¢; cold finished, 0.375-3.499 in., 1100-F, 47.9¢ to 42.4¢.

Screw Machine Stock: Rounds, 2011-T3, ¼-11/32 in., 63.5¢ to 50.1¢; ⅜-1½ in., 49.9¢ to 46.9¢; 1 9/16-3 in., 45.7¢ to 42.7¢. Base 5000 lb.

Drawn Wire: Coiled, 0.051-0.374 in., 1100, 47.1¢ to 35.8¢; 5052, 56.7¢ to 44.4¢; 2017-T4, 64.3¢ to 44.7¢; 6061-T4, 59.5¢ to 44.1¢.

Extruded Tubing: Rounds, 6063-T5, OD 1¼-2 in., 44.4¢ to 64.8¢; 2-4 in., 40.3¢ to 54.6¢; 4-6 in., 40.8¢ to 49.8¢; 6-9 in., 41.4¢ to 52.1¢.

Roofing Sheet: Flat, per sheet, 0.032-in., 42⅝ x 60-in., $2.998; x 96-in., $4.801; x 120-in., $6.002; x 144-in., $7.202. Coiled sheet, per lb, 0.019 in. x 28 in., 30.9¢.

Magnesium

(F.o.b. mill, freight allowed)

Sheet & Plate: FS1-O ¼ in., 59¢; 3/16 in., 60¢; ½ in., 59¢; 0.064 in., 76¢; 0.032 in., 97¢. Specification grade higher. Base 30,000 lb.

Extruded Round Rod: M, diam ¼ to 0.311 in., 79¢; ½ to ¾ in., 62.5¢; 1¼ to 1.749 in., 59¢; 2½ to 5 in., 54.5¢. Other alloys higher. Base up to ⅝ in. diam, 10,000 lb; ¾ to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes: Rectangles: M. In weight per ft for perimeters less than size indicated: 0.10 to 0.11 lb, 3.5 in., 67.3¢; 0.22 to 0.25 lb, 5.9 in., 64.3¢; 0.50 to 0.59 lb, 8.6 in., 61.7¢; 1.8 to 2.59 lb, 19.5 in., 59.8¢; 4 to 6 lb, 28 in., 55¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb; ½ to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: M, 0.049 to 0.057 in. wall thickness: OD ¼ to 5/16 in., $1.46; 5/16 to ⅜ in., $1.32; ½ to ⅝ in., 99¢; 1 to 2 in., 82¢; 0.165 to 0.219 in. wall: OD, ⅝ to ¾ in., 67¢; 1 to 2 in., 63¢; 3 to 4 in., 62¢. Other alloys higher. Base, OD: Up to 1½ in., 10,000 lb; 1½ to 3 in., 20,000 lb; over 3 in., 30,000 lb.

Titanium

(10,000 lb base, f.o.b. mill)

Sheet and strip, commercially pure, $14.00-$14.50; alloy $16.50; Plate, HR, commercially pure, $11.50-$12.00; alloy, $12.50-$12.75; Wire, rolled and/or drawn, commercially pure, $10.50-$11.00; alloy, $12.50; Bar, HR or forged, commercially pure, $8.50-$8.75; alloy, $8.50-$9.00.

Nickel, Monel, Inconel

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	102	78	99
Strip, CR	102	87	125
Rod, Bar, HR	87	69	93
Angles, HR	87	69	93
Plate, HR	97	82	95
Seamless Tube	122	108	153
Shot, Blocks		85	

Copper, Brass, Bronze

(Freight included on 500 lb)

	Sheet	Rods	Extruded Shapes
Copper	52.79	....	54.86
Copper, h-r	54.76	51.11	....
Copper, drawn	....	52.26	....
Low brass	49.75	49.69	....
Yellow brass	46.27	46.21	....
Red brass	50.99	50.93	....
Naval brass	....	44.30	45.56
Leaded brass	....	....	43.09
Com. bronze	52.78	52.72	....
Mang. bronze	53.73	47.83	49.39
Phos. bronze	73.03	73.53	....
Munts metal	48.14	43.95	45.20
Ni silver, 10 pct	60.20	63.28	66.34

Beryllium copper, CR, 1.9% Be, Base 1000 lb, f.o.b.

Strip	$1.74
Rod, bar, wire	1.71

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed	23.20
Aluminum pig	21.50
Antimony, American, Laredo, Tex.	28.50
Beryllium copper, per lb cont'd Be	$40.00
Beryllium aluminum 5% Be, Dollars per lb contained Be	$72.75
Bismuth, ton lots	$2.25
Cadmium, del'd	$1.70
Cobalt, 97-99% (per lb)	$2.60 to $2.67
Copper, electro, Conn. Valley	36.00
Copper, Lake, delivered	36.00
Gold, U. S. Treas., per troy oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$90 to $100
Lead, St. Louis	14.80
Lead, New York	15.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb, pig	28.50
ingot	29.25
Magnesium, sticks, 100 to 500 lb	49.00
Mercury, dollars per 76-lb flask, f.o.b. New York	$295 to $298
Nickel electro, f.o.b. N. Y. warehouse	67.67
Nickel oxide sinter, at Copper Cliff, Ont., contained nickel	60.75
Palladium, dollars per troy oz.	$18 to $20
Platinum, dollars per troy oz.	$76 to $79
Silver, New York, cents per troy oz.	90.50
Tin, New York	91.75
Titanium, sponge, grade A-1,	$3.95
Zinc, East St. Louis	12.00
Zinc, New York	13.50
Zirconium, sponge	$10.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5-5 ingot	
No. 115	34.50
No. 120	33.75
No. 123	33.25
80-10-10 ingot	
No. 305	38.00
No. 315	36.25
88-10-2 ingot	
No. 210	47.25
No. 215	43.75
No. 245	39.75
Yellow ingot	
No. 405	29.25
Manganese bronze	
No. 421	31.75

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper, max.	27.50-28.25
0.60 copper, max.	27.25-28.00
Piston alloys (No. 122 type)	26.00-27.00
No. 12 alum. (No. 2 grade)	25.50-26.00
108 alloy	26.00-26.50
195 alloy	27.00-28.00
13 alloy (0.60 copper max.)	27.75-28.00
ASX-679	26.00-26.50

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97½%	26.00-27.00
Grade 2—92-95%	25.00-26.00
Grade 3—90-92%	24.50-25.00
Grade 4—85-90%	23.50-24.50

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, 5000 lb lots)

Copper	
Cast, oval, 15 in. or longer	44.92
Electrodeposited	39.78
Flat rolled	45.42
Brass, 80-20	
Cast, oval, 15 in. or longer	43.515
Zinc, flat cast	20.25
Ball, anodes	18.50
Nickel, 99 pct plus	
Cast	90.50*
Cadmium	$1.70
Silver 999 fine, rolled, 100 oz. lots per troy oz., f.o.b. Bridgeport, Conn.	94⅛

Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum	63.00
Copper sulphate, 99.5 crystals, bbl.	12.85
Nickel salts, single or double, 4-100 lb bags, frt. allowed	31.25*
Nickel chloride, 300 to 400 lb.	43.50*
Silver cyanide, 100 oz. lots, per oz.	75⅛
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc cyanide, 100 lb drum	54.30

*Effective Jan. 3.

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	32	31⅛
Yellow brass	23⅞	22
Red brass	28⅛	27⅜
Comm. bronze	29¼	28⅛
Mang. bronze	22 1/6	21⅝
Yellow brass rod ends	23⅝	22

Custom Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	35
No. 2 copper wire	34
Light copper	32¼
*Refinery brass	31⅛

* Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	35
No. 2 copper wire	33⅛
Light copper	31⅝
No. 1 composition	27⅛
No. 1 comp. turnings	27
Rolled brass	20½
Brass pipe	19½
Radiators	21
Aluminum	
Mixed old cast	14½—15½
Mixed new clips	16½—17
Mixed turnings, dry	15½—16

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass	
No. 1 heavy copper and wire	32 —32⅛
No. 2 heavy copper and wire	31 —31⅛
Light copper	29 —29⅛
New type shell cuttings	29 —29⅛
Auto radiators (unsweated)	18½—19
No. 1 composition	24½—25
No. 1 composition turnings	24 —24⅛
Unlined red car boxes	18½—19
Cocks and faucets	20 —20½
Mixed heavy yellow brass	15 —15½
Old rolled brass	18 —18⅛
Brass pipe	20 —20½
New soft brass clippings	21½—22
Brass rod ends	20½—21
No. 1 brass rod turnings	19½—20
Aluminum	
Alum. pistons and struts	11 —11½
Aluminum crankcases	11 —11⅛
1100 (2S) aluminum clippings	13½—14
Old sheet and utensils	11 —11⅛
Borings and turnings	7⅛— 8
Misc. cast aluminum	11 —11½
2024 (24s) clippings	13 —13⅛
Zinc	
New zinc clippings	7⅛
Old zinc	4½— 5
Zinc routings	3 — 3⅛
Old die cast scrap	3¼— 3⅜
Nickel and Monel	
Pure nickel clippings	75
Clean nickel turnings	60
Nickel anodes	75
Nickel rod ends	75
New Monel clippings	36 —37
Clean Monel turnings	27⅛
Old sheet Monel	32 —33
Nickel silver clippings, mixed	18
Nickel silver turnings, mixed	15
Lead	
Soft scrap lead	11½—11⅝
Battery plates (dry)	6½— 6¾
Batteries, acid free	4⅛
Magnesium	
Segregated solids	18½—19
Castings	17½—18
Miscellaneous	
Block tin	76 —77
No. 1 pewter	58 —59
No. 1 auto babbitt	48
Mixed common babbitt	12 —12½
Solder joints	18 —19
Siphon tops	40
Small foundry type	15½—16
Monotype	15
Lino. and stereotype	13½—14
Electrotype	12 —12½
Hand picked type shells	9½
Lino. and stereo. dross	6½
Electro dross	5

IRON AGE

STEEL PRICES

(Effective June 7, 1955)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply

		BILLETS, BLOOMS, SLABS			PILING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$86.00 *B3*		4.30 *B3*‖	6.45 *B3*	4.30 *B3*						
	Buffalo, N. Y.	$64.00 *B3*	$78.00 *B3, R3*	$86.00 *B3, R3*	5.075 *B3*	4.30 *B3*‖	6.45 *B3*	4.30 *B3*	4.05 *B3,R3*	5.75 *R7,S10*	6.15 *B3*	8.425 *B3*		
	Claymont, Del.													
	Harrison, N. J.													12.45 *C11*
	Conshohocken, Pa.								4.10 *A2*	5.80 *A2*	6.15 *A2*			
	New Bedford, Mass.									6.20 *R6*				
	Johnstown, Pa.	$64.00 *B3*	$78.00 *B3*	$86.00 *B3*		4.30 *B3*	6.45 *B3*		4.05 *B3*					
	Boston, Mass.									6.30 *T8*				12.80 *T8*
	New Haven, Conn.									6.20 *D1* 6.50 *A5*				
	Phoenixville, Pa.					4.20 *P2*		4.30 *P2*						
	Sparrows Pt., Md.								4.05 *B3*	5.75 *B3, T8*	6.15 *B3*	8.425 *B3*		
	Bridgeport, Wallingford, Conn.	$69.00 *N8*	$83.00 *N8*						4.35 *N8*	6.20 *W1*			7.00 *N8*	
	Pawtucket, R. I. Worcester, Mass.									6.30 *N7* 6.60 *A5*				12.75 *A5* 12.80 *N7*
MIDDLE WEST	Alton, Ill.								4.225 *L1*					
	Ashland, Ky.								4.05 *A7*					
	Canton-Massillon, Dover, Ohio		$80.00 *R3*	$86.00 *R3, T5*										12.45 *G4*
	Chicago, Ill.	$64.00 *U1*	$78.00 *R3, U1,W8*	$86.00 *U1, W8,R3*	5.075 *U1*	4.25 *U1, W8*	6.40 *U1, Y1*	4.25 *U1*	4.05 *A1,N4, W8*	5.85 *A1,T8*				12.45 *T8*
	Cleveland, Ohio									5.75 *A5, J3*		8.60 *A5*		12.45 *A5*
	Detroit, Mich.			$86.00 *R5*					4.15 *G3,M2*	5.85 *D1,D2, G3,M2,P11*	6.25 *G3*	8.70 *D2, G3*		
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana	$64.00 *U1*	$78.00 *U1*	$86.00 *U1, Y1*	5.075 *I3*	4.25 *I3, U1*	6.40 *U1, I3*		4.05 *I3, U1,Y1*	5.85 *I3*	6.15 *U1, I3,Y1*	8.60 *Y1*	6.70 *U1, Y1*	
	Sterling, Ill.								4.15 *N4*					
	Indianapolis, Ind.									5.90 *C5*				
	Newport, Ky.												6.70 *Y5*	
	Middletown, Ohio									5.75 *A7*				
	Niles, Warren, Ohio Sharon, Pa.								4.05 *S1,R3*	5.75 *S1,R3, T4*	6.15 *S1, R3*	8.60 *S1, R3*	6.70 *S1*	12.45 *S1*
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	$64.00 *U1, J3*	$78.00 *J3, U1,C11*	$86.00 *U1, C11*	5.075 *U1*	4.25 *J3, U1*	6.40 *J3, U1*	4.25 *U1*	4.05 *P6*	5.75 *B4,J3, S7*			6.70 *S9*	12.45 *S9*
	Portsmouth, Ohio								4.05 *P7*	5.75 *P7*				
	Weirton, Wheeling, Follansbee, W. Va.					4.25 *W3*			4.05 *W3*	5.75 *F3,W3*	6.15 *W3*	8.60 *W3*		
	Youngstown, Ohio		$78.00 *C10*	$86.00 *Y1, C10*		4.25 *Y1*	6.40 *Y1*		4.05 *U1,Y1*	5.75 *Y1,C5*	6.15 *U1, Y1*	8.60 *Y1*	6.70 *U1, Y1*	12.45 *C5*
WEST	Fontana, Cal.	$72.00 *K1*	$86.00 *K1*	$105.00 *K1*		4.90 *K1*	7.05 *K1*	5.25 *K1*	4.825 *K1*	7.50 *K1*	7.25 *K1*		8.10 *K1*	14.55 *K1*
	Geneva, Utah		$78.00 *C7*			4.25 *C7*	6.40 *C7*							
	Kansas City, Mo.					4.30 *S2*	6.45 *S2*				6.40 *S2*		6.95 *S2*	
	Los Angeles, Torrance, Cal.		$87.50 *B2*	$106.00 *B2*		4.95 *B2, C7*	7.10 *B2*		4.80 *B2,C7*	7.00 *C1*				
	Minnequa, Colo.					4.70 *C6*			5.15 *C6*					
	Portland, Ore.					5.00 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$87.50 *B2*			4.90 *B2* 4.95 *P9*	7.05 *B2*		4.80 *B2,C7*					
	Seattle, Wash.		$91.50 *B2*			5.00 *B2*	7.15 *B2*		5.05 *B2, P12*					
SOUTH	Atlanta, Ga.								4.25 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$64.00 *T2*	$78.00 *T2*			4.25 *C16, R3,T2*	6.40 *T2*		4.05 *R3, T2,C16*		6.15 *T2*			
	Houston, Lone Star, Tex.	$70.00 *L3*	$83.00 *S2*	$91.00 *S2*		4.30 *S2*	6.45 *S2*				6.40 *S2*		6.95 *S2*	

STEEL PRICES

(Effective June 7, 1955)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS										WIRE ROD	TINPLATE†		BLACK PLATE
		Hot-rolled *18* ga. hvyr.	Cold-rolled	Galvanized *10* ga.	Enameling *12* ga.	Long Terne *10* ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot-rolled *19* ga.			Coke* *1.25*-lb. base box	Electro* *0.25*-lb. base box	Hollowware Enameling *29* ga.
EAST	Bethlehem, Pa.														
	Buffalo, N. Y.	4.05 *B3*	4.95 *B3*				6.10 *B3*	7.50 *B3*				4.675 *W6*	† Special coated mfg. terne deduct 95¢ from 1.25-lb coke base box price. Can-making quality blackplate 55 to 128 lb. deduct $2.20 from 1.25-lb. coke base box. * COKES: 1.50-lb. add 25¢. ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.10. Differential 1.00 lb./0.25 lb. add 85¢.		
	Claymont, Del.														
	Coatesville, Pa.														
	Conshohocken, Pa.	4.10 *A2*	5.00 *A2*				6.15 *A2*								
	Harrisburg, Pa.														
	Hartford, Conn.														
	Johnstown, Pa.											4.675 *B3*			
	Fairless, Pa.	4.10 *U1*	5.00 *U1*				6.15 *U1*	7.55 *U1*					$8.90 *U1*	$7.60 *U1*	
	New Haven, Conn.														
	Phoenixville, Pa.														
	Sparrows Pt., Md.	4.05 *B3*	4.95 *B3*	5.45 *B3*			6.10 *B3*	7.50 *B3*	8.20 *B3*			4.775 *B3*	$8.90 *B3*	$7.60 *B3*	
	Worcester, Mass.											4.975 *A5*			
	Trenton, N. J.														
MIDDLE WEST	Alton, Ill.											4.85 *L1*			
	Ashland, Ky.	4.05 *A7*		5.45 *A7*	5.375 *A7*										
	Canton-Massillon, Dover, Ohio			5.45 *R1, R3*						5.175 *R1*					
	Chicago, Joliet, Ill.	4.05 *A1, W8*					6.10 *U1*					4.675 *A5, N4, R3*			
	Sterling, Ill.											4.775 *N4*			
	Cleveland, Ohio	4.05 *J3, R3*	4.95 *J3, R3*		5.375 *R3*		6.10 *J3, R3*	7.50 *J3, R3*				4.675 *A5*			
	Detroit, Mich.	4.15 *G3, M2*	5.05 *G3*				6.20 *G3*	7.60 *G3*							
	Newport, Ky.	4.05 *N5*	4.95 *N5*	5.45 *N5*											
	Gary, Ind. Harbor, Indiana	4.05 *I3, U1, Y1*	4.95 *I3, U1, Y1*	5.45 *U1, I3*	5.375 *I3, U1*	5.85 *U1*	6.10 *U1, I3, Y1*	7.50 *U1, Y1*				4.675 *Y1*	$8.80 *I3, U1, Y1*	$7.50 *I3, U1, Y1*	6.20 *U1, Y1*
	Granite City, Ill.	4.25 *G2*	5.15 *G2*	5.65 *G2*	5.575 *G2*									$7.60 *G2*	6.30 *G2*
	Kokomo, Ind.	4.15 *C9*		5.55 *C9*						5.20 *C9*		4.775 *C9*			
	Mansfield, Ohio					5.85 *E2*				5.175 *E2*					
	Middletown, Ohio		4.95 *A7*		5.375 *A7*	5.85 *A7*									
	Niles, Warren, Ohio Sharon, Pa.	4.05 *S1, R3* 5.30 *N3*	4.95 *R3* 5.975 *N3*	5.45 *N3, R3*	6.725 *N3*	5.85 *N3*	6.10 *S1, R3*	7.50 *R3*					$8.80 *R3*	$7.50 *R3*	
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	4.05 *J3, U1, P6*	4.95 *J3, U1, P6*	5.45 *U1*	5.375 *U1*		6.10 *J3, U1*	7.50 *J3, U1*	8.20 *U1*			4.675 *A5* 4.875 *P6*	$8.80 *J3, U1*	$7.50 *J3, U1*	6.20 *U1*
	Portsmouth, Ohio	4.05 *P7*	4.95 *P7*									4.675 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	4.05 *W3, W5*	4.95 *W3, W5, F3*	5.45 *W3, W5*		5.85 *W3, W5*	6.10 *W3*	7.50 *W3*					$8.80 *W3, W5*	$7.50 *W3, W5*	6.20 *F3, W5*
	Youngstown, Ohio	4.05 *U1, Y1*	4.95 *Y1*		5.375 *Y1*		6.10 *U1, Y1*	7.50 *Y1*				4.675 *Y1*			
WEST	Fontana, Cal.	4.825 *K1*	6.05 *K1*				6.875 *K1*	8.55 *K1*				5.475 *K1*			
	Geneva, Utah	4.15 *C7*													
	Kansas City, Mo.											4.925 *S2*			
	Los Angeles, Torrance, Cal.											5.475 *C7, B2*			
	Minnequa, Colo.											4.925 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	4.75 *C7*	5.90 *C7*	6.20 *C7*								5.325 *C7*	$9.55 *C7*	$8.25 *C7*	
	Seattle, Wash.														
SOUTH	Atlanta, Ga.														
	Fairfield, Ala. Alabama City, Ala.	4.05 *R3, T2*	4.95 *T2*	5.45 *R3, T2*			6.10 *T2*			5.35 *R3*		4.675 *T2, R3*	$8.90 *T2*	$7.60 *T2*	
	Houston, Tex.											4.925 *S2*			

IRON AGE

STEEL PRICES

(Effective June 7, 1965)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.				5.075 *B3*	6.625 *B3*	6.45 *B3*					
	Buffalo, N. Y.	4.30 *B3,R3*	4.30 *B3,R3*	5.45 *B5*	5.075 *B3,R3*	6.625 *B3,B5*	6.45 *B3*	4.225 *B3,R3*			6.45 *B3*	5.75 *W6*
	Claymont, Del.							4.225 *C4*		5.80 *C4*		
	Coatesville, Pa.							4.225 *L4*		5.80 *L4*	6.45 *L4*	
	Conshohocken, Pa.							4.225 *A2*	5.275 *A2*		6.45 *A2*	
	Harrisburg, Pa.							4.225 *C3*	5.275 *C3*			
	Hartford, Conn.			5.90 *R3*		6.925 *R3*						
	Johnstown, Pa.	4.30 *B3*	4.30 *B3*		5.075 *B3*		6.45 *B3*	4.225 *B3*		5.80 *B3*	6.45 *B3*	5.75 *B3*
	Fairless, Pa.	4.45 *U1*	4.45 *U1*		5.225 *U1*							
	Newark, N. J.			5.85 *W10*		6.80 *W10*						
	Camden, N. J.			5.85 *P10*								
	Bridgeport, Putnam, Conn.	4.55 *N8*		5.95 *W10*	5.225 *N8*			4.475 *N8*				
	Sparrows Pt., Md.		4.30 *B3*					4.225 *B3*		5.80 *B3*	6.45 *B3*	5.85 *B3*
	Palmer, Worcester, Readville, Mansfield, Mass.			5.85 *W11* 5.95 *B5,C14*		6.925 *A5,B5*						6.05 *A5, W6*
MIDDLE WEST	Alton, Ill.	4.50 *L1*										5.925 *L1*
	Ashland, Newport, Ky.							4.225 *A7,N5*		5.80 *N5*		
	Canton-Massillon, Mansfield, Ohio	4.40 *R3*		5.40 *R2,R3*	5.075 *R3,T5*	6.625 *R2,R3, T5*		4.225 *E2*				
	Chicago, Joliet, Ill.	4.30 *U1, N4,W8,R3, P15*	4.30 *N4,R3, P15*	5.40 *A5,W10, W8,B5,L2*	5.075 *U1,R3, W8*	6.625 *A5,W8, W10,L2,B5*		4.225 *U1,W8, I3,A1,R3*	5.275 *U1*	5.80 *U1*	6.45 *U1*	5.75 *A5, R3,N4,W7*
	Cleveland, Ohio	4.30 *R3*	4.30 *R3*	5.40 *A5,C13*		6.625 *A5,C13*	6.45 *R3*	4.225 *J3,R3*	5.275 *J3*		6.45 *J3,R3*	5.75 *A5, C13*
	Detroit, Mich.	4.40 *G3* 4.45 *R5*		5.40 *R5* 5.60 *B5,P8* 5.65 *P3*	5.075 *R5* 5.175 *G3*	6.625 *R5* 6.825 *B5,P3 P8*	6.55 *G3*	4.325 *G3*			6.55 *G3*	
	Duluth, Minn.											5.75 *A5*
	Gary, Ind. Harbor, Crawfordsville	4.30 *I3, U1, Y1*	4.30 *I3, U1, Y1*	5.60 *M5,R3,*	5.075 *I3, U1, Y1*	6.625 *M5, R3*	6.45 *U1,I3, Y1*	4.225 *I3, U1,Y1*	5.275 *I3*	5.80 *U1,Y1*	6.45 *U1,I3, Y1*	5.85 *M4*
	Granite City, Ill.							4.425 *G2*				
	Kokomo, Ind.											5.85 *C9*
	Sterling, Ill.	4.40 *N4*	4.40 *N4*									5.85 *N4*
	Niles, Ohio Sharon, Pa.	4.30 *R3*					6.45 *R3*	4.225 *S1,R3*		5.80 *S1*	6.45 *S1*	
	Pittsburgh, Pa. Midland, Pa.	4.30 *J3, U1, C11*	4.30 *J3, U1*	5.40 *A5,C8, C11,J3 W10,B4,R3*	5.075 *U1,C11*	6.625 *A5,C11, W10,C8,R3*	6.45 *J3, U1*	4.225 *J3, U1*	5.275 *U1*	5.80 *U1*	6.45 *J3, U1*	5.75 *A5,J3, P6*
	Portsmouth, Ohio											5.75 *P7*
	Weirton, Wheeling, Follansbee, W. Va.	4.30 *W3*						4.225 *W3, W5*				
	Youngstown, Ohio	4.30 *U1,Y1, C10,R3*	4.30 *U1,Y1, R3*	5.40 *F2,Y1, C10*	5.075 *U1,Y1, C10*	6.625 *Y1,C10* 6.665 *F2*	6.45 *U1,Y1*	4.225 *U1,Y1, R3*		5.80 *Y1*	6.45 *Y1*	5.75 *Y1*
WEST	Emeryville, Cal.	5.05 *J5*	5.05 *J5*									
	Fontana, Cal.	5.00 *K1*	5.00 *K1*		6.125 *K1*		7.70 *K1*	4.875 *K1*		6.45 *K1*	7.15 *K1*	
	Geneva, Utah							4.225 *C7*			6.45 *C7*	
	Kansas City, Mo.	4.55 *S2*	4.55 *S2*		5.325 *S2*		6.70 *S2*					6.00 *S2*
	Los Angeles, Torrance, Cal.	5.00 *B2,C7*	5.00 *B2,C7*	6.05 *R3*	6.125 *B2*		7.15 *B2*					6.70 *B2*
	Minnequa, Colo.	4.75 *C6*	4.75 *C6*					5.075 *C6*				6.00 *C6*
	Portland, Ore.	5.05 *O2*	5.05 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	5.00 *C7,P9* 5.05 *B3*	5.00 *C7,P9* 5.05 *B3*				7.20 *B2*					6.70 *C7*
	Seattle, Wash.	5.05 *B2,P12, N6*	5.05 *B2,P12*				7.20 *B2*	5.125 *B2*		6.70 *B2*	7.35 *B2*	
SOUTH	Atlanta, Ga.	4.50 *A9*	4.50 *A9*									5.95 *A9*
	Fairfield, Ala. City, Birmingham, Ala.	4.30 *T2,C16, R3*	4.30 *T2,C16, R3*				6.45 *T2*	4.225 *T2,R3*			6.45 *T2*	5.75 *R3, T2*
	Houston, Ft. Worth, Lone Star, Tex.	4.55 *S2*	4.55 *S2*		5.325 *S2*		6.70 *S2*	4.55 *L3* 4.275 *S2*		5.85 *S2*	6.50 *S2*	6.00 *S2*

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angell Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, O.
A8 Atlantic Steel Co., Atlanta, Ga.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire Spencer Steel Div., Birdsboro, Pa.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C5 Cold Metal Products Co., Youngstown, O.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham

D1 Detroit Steel Corp., Detroit
D2 Detroit Tube & Steel Div., Detroit
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill
D5 Henry Disston & Sons, Inc., Philadelphia

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimmons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G1 Globe Iron Co., Jackson, O.
G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid-States Steel & Wire Co., Crawfordsville, Ind.
M5 Monarch Steel Div., Hammond, Ind.
M6 Mystic Iron Works, Everett, Mass.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N5 Newport Steel Corp., Newport, Ky.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Northeastern Steel Corp., Bridgeport, Conn.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P12 Pacific Steel Rolling Mills, Seattle
P13 Phoenix Mfg. Co., Joliet, Ill.

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Rotary Electric Steel Co., Detroit
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Corp., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw & Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T6 Tremont Nail Co., Wareham, Mass.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Co., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W11 Worcester Pressed Steel Co., Worcester, Mass.

Y1 Youngstown Sheet & Tube Co., Youngstown

PIPE AND TUBING

Base discounts (net) f.o.b. mills. Base price about $290 per net ton.

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½–3 In.		2 In.		2½ In.		3 In.		3½–4 In.	
STANDARD T. & C.	Blk.	Gal	Blk.	Gal	Blk.	Gal	Blk.	Gal	Blk.	Gal	Blk.	Gal	Blk.	Gal	Blk.	Gal	Blk.	Gal	Blk.	Gal	Blk.	Gal
Sparrows Pt. *B3*	21.75	6.5	24.75	10.5	27.25	14.0	29.75	14.75	30.25	15.75	30.75	16.25	32.25	16.0	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown *R3*	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	.....	.....	.....	.....	.....	.....	.....	.....
Fontana *K1*	10.75	+4.5	13.75	+0.5	16.25	3.0	18.75	5.75	19.25	4.75	19.75	5.25	21.25	5.0	.....	.....	.....	.....	.....	.....	.....	.....
Pittsburgh *J3*	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	13.5	+1.50	17.5	0.75	20.0	3.25	21.5	4.75
Alton, Ill. *L1*	21.75	6.5	24.75	10.5	27.25	14.0	29.75	14.75	30.25	15.75	30.75	16.25	32.25	16.0	.....	.....	.....	.....	.....	.....	.....	.....
Sharon *M3*	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	.....	.....	.....	.....	.....	.....	.....	.....
Fairless *N2*	21.75	6.5	24.75	10.5	27.25	14.0	29.75	14.75	30.25	15.75	30.75	16.25	32.25	16.0	.....	.....	.....	.....	.....	.....	.....	.....
Pittsburgh *N1*	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	13.5	+1.50	17.5	0.75	20.0	3.25	21.5	4.75
Wheeling *W5*	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	.....	.....	.....	.....	.....	.....	.....	.....
Wheatland *W4*	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown *Y1*	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	13.5	+1.50	17.5	0.75	20.0	3.25	21.5	4.75
Indiana Harbor *Y1*	22.75	7.5	25.75	11.5	28.25	15.0	30.75	15.75	31.25	16.75	31.75	17.25	33.25	17.0	.....	.....	.....	.....	.....	.....	.....	.....
Lorain *N2*	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	13.5	+1.50	17.5	0.75	20.0	3.25	21.5	4.75
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	25.25	11.5	29.25	15.5	31.25	19.0	31.75	17.75	32.25	18.75	32.75	19.25	33.25	18.0	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown *R3*	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.25	35.25	20.0	.....	.....	.....	.....	.....	.....	.....	.....
Fairless *N2*	25.25	11.5	29.25	15.5	31.25	19.0	31.75	17.75	32.25	18.75	32.75	19.25	33.25	18.0	.....	.....	.....	.....	.....	.....	.....	.....
Fontana *K1*	14.25	.....	18.25	.....	20.25	.....	20.75	.....	21.25	.....	21.75	.....	22.25	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pittsburgh *J3*	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.25	35.25	20.0	14.0	.....	19.0	3.25	21.5	5.75	26.5	10.75
Alton, Ill. *L1*	25.25	11.5	29.25	15.5	31.25	19.0	31.75	17.75	32.25	18.25	32.75	19.25	33.25	18.0	.....	.....	.....	.....	.....	.....	.....	.....
Sharon *M3*	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.75	35.25	20.0	.....	.....	.....	.....	.....	.....	.....	.....
Pittsburgh *N1*	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.75	35.25	20.0	14.0	.....	19.0	3.25	21.5	5.75	26.5	10.75
Wheeling *W5*	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.75	35.25	20.0	.....	.....	.....	.....	.....	.....	.....	.....
Wheatland *W4*	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.75	35.25	20.0	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown *Y1*	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.75	35.25	20.0	14.0	.....	19.0	3.25	21.5	5.75	26.5	10.75
Indiana Harbor *Y1*	26.25	12.5	30.25	16.5	32.25	20.0	32.75	18.75	33.25	19.75	33.75	20.75	34.25	19.0	.....	.....	.....	.....	.....	.....	.....	.....
Lorain *N2*	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.75	35.25	20.0	14.0	.....	19.0	3.25	21.5	5.75	26.5	10.75

Threads only, buttweld and seamless 2½ pt higher discount. Plain ends, buttweld and seamless, 3-in. and under, 4½ pt higher discount. Buttweld jobbers discount, 5 pct.

Galvanized discounts based on zinc price range of over 9¢ to 11¢ incl. per lb, East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt. e.g., zinc price range of over 11¢ to 13¢ would lower discounts; zinc price in range of over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 12.00¢ per lb.

Steel Prices

(Effective June 7, 1955)

To identify producers, see Key on preceding page.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Treated
Bessemer *UI*	4.45	5.35	5.425				
So. Chicago *R3*				7.30			
Ensley *T1*	4.45	5.35					
Fairfield *T2*		5.35		7.30		5.275	
Gary *U1*	4.45	5.35				5.275	
Ind. Harbor *I3*	4.45		5.425	7.30		5.275	
Johnstown *B3*		5.35					
Joliet *U1*		5.35	5.425				
Kansas City *S2*				7.30			11.50
Lackawanna *B3*	4.45	5.35	5.425			5.275	
Minnequa *C6*	4.45	5.35	5.425	7.30		5.275	11.50
Pittsburgh *O1*					11.00		11.50
Pittsburgh *P3*					11.00		11.50
Pittsburgh *J3*				7.30			
Seattle *B2*				7.00		5.425	12.00
Steelton *B3*	4.45		5.425			5.275	
Struthers *Y1*				7.30			
Torrance *C7*						5.425	
Williamsport *S3*		5.35					
Youngstown *R3*				7.30			

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Fully Processed
Field	8.025	8.225	
Armature	8.50	8.75	9.25
Elect.	9.10	9.35	9.85
Motor	10.10	10.35	10.85
Dynamo	11.00	11.25	11.75
Trans. 72	11.95	12.20	12.70
Trans. 65	12.50	Grain Oriented	
Trans. 58	13.00	Trans. 80	16.60
Trans. 52	14.00	Trans. 73	17.10

Producing points: Beech Bottom (*W5*); Brackenridge (*A5*); Granite City (*G2*); Indiana Harbor (*I3*); Mansfield (*E2*); Newport, Ky. (*N5*); Niles, O. (*N3*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville (*A7*).

* Coils 75¢ higher.

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails	Woven Wire Fence 9–15½ ga.	"T" Fence Posts	Single Loop Bale Ties	Galv. Barbed and Twisted Barbless Wire	Merch. Wire Annld ¢/lb.	Merch. Wire* Galv. ¢/lb.
	Col	Col	Col	Col	Col		
Alabama City *R3*	137	146		155	159	6.90	7.30
Aliquippa, Pa. *J3*	137	149			156	6.90	7.45
Atlanta *A8*	139	151		157	164	7.00	7.525
Bartonsville *K2*	139	151		157	164	7.00	7.55
Buffalo *W6*						6.90	7.30
Chicago, Ill. *N4*	137	150		155	163	6.90	7.475
Cleveland *A6*	142						
Cleveland *A5*						6.90	
Crawfordsville *M4*	139	151		157	159	7.00	7.55
Donora, Pa. *A5*	137	149		155	162	6.90	7.45
Duluth *A5*	137	149	150	155	162	6.90	7.45
Fairfield, Ala. *T2*	137	149		155	162	6.90	7.45
Galveston *D4*	139						
Houston *S2*	142	154			164	7.15	7.70
Johnstown, Pa. *B3*	137	149			162	6.90	7.45
Joliet, Ill. *A5*	137	149		155	162	6.90	7.45
Kokomo, Ind. *C9*	139	148		157	161	7.00	7.55
Los Angeles *B2*						7.85	
Kansas City *S2*	142	158		167	164	7.15	7.90
Minnequa *C6*	142	151	155	160	164	7.15	7.55
Monessen *P6*	137	151			163	6.90	7.45
Moline, Ill. *R3*			155				
Pittsburg, Cal. *C7*	156	172		179	182	7.85	8.40
Portsmouth *P7*						6.90	7.90
Rankin, Pa. *A5*	137	149			162	6.90	7.45
So. Chicago *R3*	137	146	150		159	6.90	7.30
S. San Francisco *C6*					179		
Sparrows Pt. *B3*	139			157	164	7.00	7.55
Struthers, O. *Y1*						6.90	7.55
Worcester *A5*	143					7.20	
Williamsport, Pa. *S3*			150				

Cut Nails, carloads, base $8.30 per keg at Conshohocken Pa. (*A2*). Galvanized products computed with zinc at 11.0¢ per lb. Exceptions: Alabama City and So. Chicago computed with zinc at 5¢; Chicago, zinc 12¢.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26–0.40	0.41–0.60	0.61–0.80	0.81–1.05	1.06–1.35
Bridgeport, New Britain, Conn. *N8*	5.75	8.05	9.00	11.15	13.85
Buffalo, N. Y. *R7*	5.75	8.05	9.00	10.95	13.25
Carnegie, Pa. *S9*		8.05	9.00	11.15	13.85
Cleveland *A5*	5.75	8.05	9.00	11.15	13.85
Detroit *D1*	5.85	8.25	9.20	10.95	
Detroit *D2*	5.85	8.25	9.20		
Harrison, N. J. *C11*			9.30	11.45	14.15
Indianapolis *C5*	6.00	8.20	9.00	11.15	13.85
New Castle, Pa. *B4*	5.75	8.05	9.00	10.95	
New Haven, Conn. *D1*	6.20	8.35	9.30	11.25	
Pawtucket, R. I. *N7*	6.30	8.35	9.30	11.45	14.15
Riverdale, Ill. *A1*	5.85	8.05	9.00	11.15	13.85
Sharon, Pa. *S1*	5.75	8.05	9.00	11.15	13.85
Trenton *R4*		8.35	9.30	11.25	13.40
Wallingford *W1*	6.20	8.35	9.30	11.45	14.15
Warren, Ohio *T4*	5.75	8.05	9.00	11.15	13.85
Weirton, W. Va. *W3*	5.85	8.05	9.00	10.95	13.25
Worcester, Mass. *A5*	6.00	8.35	9.30	11.45	14.15
Youngstown *C5*	5.85	8.05	9.00	11.15	13.85

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	Size B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
Babcock & Wilcox	2	13	28.33	33.97	27.48	32.93
	2½	12	38.15	45.74	37.00	44.36
	3	12	44.05	52.82	42.72	51.23
	3½	11	51.43	61.66	49.88	59.81
	4	10	68.29	81.88	66.24	79.42
National Tube	2	13	28.33	33.97	27.48	
	2½	12	38.15	45.74	37.00	
	3	12	44.05	52.82	42.72	
	3½	11	51.43	61.66	49.88	
	4	10	68.29	81.88	66.24	
Pittsburgh Steel	2	13	28.33	33.97		
	2½	12	38.15	45.74		
	3	12	44.05	52.82		
	3½	11	51.43	61.66		
	4	10	68.29	81.88		

WAREHOUSES

Base price, f.o.b., dollars per 100 lb.

City	City Delivery Charge	Sheets Hot-Rolled	Sheets Cold-Rolled	Sheets Galvanized (10 gage)	Strip Hot-Rolled	Strip Cold-Rolled	Plates	Shapes Standard Structural	Bars Hot-Rolled	Bars Cold-Finished	Alloy Bars As rolled 4615 As rolled	Alloy Bars Hot-Rolled 4140 Annealed	Alloy Bars Cold-Drawn 4615 As rolled	Alloy Bars Cold-Drawn 4140 Annealed
Baltimore	$.20	6.02	7.51	7.79–7.89	6.69	.....	6.37	6.72	6.68	8.02	12.94	12.54	15.34	15.19
Birmingham	.15	6.35–6.50	7.35–8.10	8.25–9.00	6.60	8.85	6.65	6.65	6.50	8.05	.....	16.00	.....	19.00
Boston	.10	7.23	6.23–8.78	9.57	7.47	9.75	7.37	7.49	7.20	8.00	12.85–13.00	12.60	15.40	15.25
Buffalo	.25	6.30	7.40	8.64	6.65	7.02	6.60	6.67	6.45	7.40	12.70	12.15–12.30	15.10	14.95
Chicago	.20	6.38	7.38	8.30	6.62	.....	6.52	6.69	6.51	7.25	12.25	12.03	14.60	14.70
Cincinnati	.20	6.49–6.53	7.37–7.42	8.25–8.30	6.56–6.91	.....	6.81–6.86	6.86	6.75–6.80	7.55	12.55	12.30	14.90	14.95
Cleveland	.20	6.38	7.38	8.25	6.72	.....	6.69	7.02	6.67	7.35	11.96	12.11	.....	14.76
Denver		8.15	9.80–10.05	10.72	8.60	.....	8.10	8.15	8.30	9.92	.....	.....	.....	17.12
Detroit	.20	6.57	7.57	8.58	6.90	.....	6.80	7.16	6.79	7.54	12.65	12.25	15.05	14.90
Houston		7.35	7.80	9.95–9.99	7.70	.....	7.35	7.60	7.70	9.50–9.40	.....	13.25	.....	.....
Kansas City	.20	7.05	8.05	8.97	7.29	.....	7.19–7.39	7.36	7.18	8.02	13.12	12.72	15.52	15.37
Los Angeles	.10	7.50	9.35	9.95	7.85	.....	7.45	7.65	7.45–7.55	10.15*	.....	13.45	.....	16.60
Memphis	.10	6.79	7.69	.....	6.90	.....	7.01	7.09	6.88	8.65	.....	.....	.....	.....
Milwaukee	.20	6.47	7.47	8.21–8.39	6.71	.....	6.61	6.86	6.60	7.44	12.34	12.14	14.69	14.79
New Orleans	.15	6.70	7.65	9.23	6.80	.....	6.90	7.05	6.80	8.60–10.70	.....	.....	.....	.....
New York	.10	6.97–7.07	7.91–8.56	8.79–8.89	7.56–7.66	10.15	7.27–7.37	7.38–7.48	7.37–7.47	8.73–8.83	12.63	12.43	.....	15.08
Norfolk	.20	7.00	.....	.....	7.10	.....	7.10	7.10	7.10	8.60	.....	.....	.....	.....
Philadelphia	.10	6.19	7.44	8.24[4]	6.96	.....	6.49	6.54	6.74	7.86	12.61–12.76	12.26–12.36	15.06–15.16	14.99–15.01
Pittsburgh	.20	6.38	7.38	8.30	6.72	.....	6.52	6.60	6.51	7.35	12.45	12.05	14.85	14.70
Portland	.20	7.00–7.00	7.75	9.10	7.05–7.25	.....	6.85	7.00	7.05	10.20–11.70	.....	.....	.....	.....
Salt Lake City	.20	7.65	10.20	10.70	9.05	.....	7.70	7.70–8.85	8.80	10.95	.....	.....	.....	.....
San Francisco	.20	7.55	8.95	9.45	7.80	.....	7.40	7.50	7.35	10.05*	.....	13.35	.....	16.50
Seattle	.60	8.10	9.80	10.15	8.20	.....	7.80	7.75	7.80	10.95	.....	13.80	.....	16.45
St. Louis	.20	6.67	7.67	8.59	6.91	.....	6.81	7.09	6.80	7.64	12.74	12.34	15.14	14.99
St. Paul	.20	7.04	8.04	8.96	7.28	.....	7.18	7.35	7.17	8.01	.....	12.71	.....	15.36

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets for quantity.

Exceptions: (1) 1500 to 9999 lb. (2) 1000 lb or over. (3) $.25 delivery. (4) 1000 to 1999 lb, $.25 delivery.

* Plus analysis charge.

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb
18	4	1	—	—	$1.54
18	4	1	—	5	2.245
18	4	2	—	—	1.705
1.5	4	1.5	8	—	.90
6	4	2	6	—	1.29

High-carbon chromium ..... .73
Oil hardened manganese ..... .405
Special carbon ..... .37
Extra carbon ..... .31
Regular carbon ..... .26

Warehouse prices on and east of Mississippi are 3.5¢ per lb higher. West of Mississippi, 5.5¢ higher.

CLAD STEEL

Base prices, cents per lb, f.o.b.

	Cladding	Plate (*A3, J2, L4*) 10 pct	Plate (*A3, J2, L4*) 15 pct	Plate (*A3, J2, L4*) 20 pct	Sheet (*I2*) 20 pct
Stainless Type	304	28.30	30.95	33.60	29.75
	316	33.40	36.10	38.80	42.75
	321	30.00	32.65	35.30	34.25
	347	32.20	35.40	38.60	44.25
	405	23.90	27.50	31.10	.....
	410, 430	23.40	27.00	30.60	.....

CR Strip (*S9*) Copper 10 pct 2 sides 33.00 1 side 26.00

LAKE SUPERIOR ORES

51.50% Fe; natural content, delivered lower Lake ports. Prices effective for 1955 season.

	Gross Ton
Openhearth lump	$11.25
Old range, bessemer	10.40
Old range, nonbessemer	10.25
Mesabi, bessemer	10.25
Mesabi, nonbessemer	10.10
High phosphorus	10.00

COKE

	Net-Ton
Furnace, beehive (f.o.b. oven) Connellsville, Pa.	$13.00 to $13.50
Foundry, beehive (f.o.b. oven) Connellsville, Pa.	$16.00 to $16.50
Foundry, oven coke	
Buffalo, del'l	$28.08
Chicago, f.o.b.	24.50
Detroit, f.o.b.	25.50
New England, del'd	26.05
Seaboard, N. J., f.o.b.	24.50
Philadelphia, f.o.b.	24.00
Swedeland, Pa., f.o.b.	24.00
Painesville, Ohio, f.o.b.	25.50
Erie, Pa., f.o.b.	25.00
Cleveland, del'd	27.43
Cincinnati, del'd	26.56
St. Paul, f.o.b.	23.75
St. Louis, f.o.b.	26.00
Birmingham, f.o.b.	22.65
Lone Star, Tex., f.o.b.	18.50

ELECTRODES

Cents per lb, f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE Diam. (in.)	GRAPHITE Length (in.)	GRAPHITE Price	CARBON* Diam. (in.)	CARBON* Length (in.)	CARBON* Price
24	84	22.00	40	110	10.80
20	72	21.25	40	100, 110	9.50
18 to 18	72	21.50	38	110	9.50
14	72	22.00	30	110	9.00
12	72	22.25	24	72 to 84	9.85
8 to 10	60	22.75	20	90	9.05
7	60	23.00	17	72	9.85
6	60	25.50	14	72	10.25
4	40	28.50	10, 12	60	11.10
3	40	30.00	8	60	11.40
2½	30	30.75			
2	24	47.75			

* Prices shown cover carbon nipples.

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Machine and Carriage Bolts

	Discount Less Case	Discount C.
⅛ in. & smaller x 4 in. & shorter	2	22
⅛ in. & smaller x 6 in. & shorter	+3	18
9/16 in. & ⅝ in. x 6 in. & shorter	+4	17
¾ in. & larger x 6 in. & shorter	+6	15
All diam. longer than 6 in.	+15	8
⅛ in. & smaller x 6 in. & shorter	+3	18
Lag, all diam. x 6 in. & shorter	6	25
Lag, all diam. longer than 6 in.	+2	19
Plow bolts	23	23

Nuts, H.P., C.P., reg. & hvy.

	Base Discount	Discount, Case or Keg
¾" or smaller	55	64
⅞" to 1⅛" inclusive	58	66
1¼" to 1½" inclusive	60	67½

C.P. Hex. regular & hvy

All sizes	55	64

Hot Galv Nuts (all types)

¾" or smaller	38	50
⅞" to 1⅛" inclusive	41	52½

Finished, Semi-finished, Slotted or Castellated Nuts

All sizes	55 / 66

Rivets

	Base per 100 lb
⅛ in. & larger	$9.25
	Pct Off List
7/16 in. and smaller	37

Cap Screws

	Discount Bright	Discount H.C. Heat Treated
New std. hex head, packaged ⅝" x 6" and smaller and shorter	38	28
⅞", ⅞", 1" x 6" and shorter	15	1
New std. hex head, bulk* 5" x 6" and smaller and shorter	50	42
⅞", ⅞", 1" x 6" and shorter	32	21

*Minimum quantity per item:
15,000 pieces ¼", 5/16", ⅜" diam.
5,000 pieces 7/16", ½", 9/16", ⅝" diam.
2,000 pieces ¾", ⅞", 1" diam.

Machine Screws & Stove Bolts

	Quantity	Discount Mach. Screws	Discount Stove Bolts
Packaged, package list		33	42
Bulk, bulk list			
¼-in. diam. & under	15,000- 99,999	17	59
	100,000-199,999	25	63
	200,000 & over	33	67
5/16-in. diam. & larger	15,000- 49,999	17	59
	50,000- 99,999	25	63
	100,000 & over	33	67
All diam. over 3 in. long	5,000- 49,999	..	59
	50,000- 99,999	..	63
	100,000 & over	..	67

Machine Screw & Stove Bolt Nuts

	Quantity	Discount Hex	Discount Square
Packaged, package list		30	33
Bulk, bulk list			
⅜-in. diam. & smaller	15,000- 99,999	15	17
	100,000-199,999	23	25
	200,000 & over	31	33

REFRACTORIES

Fire Clay Brick — Carloads per 1000

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5.00)	$114.00
No. 1 Ohio	107.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	107.00
No. 2 Ohio	98.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50)	17.00

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$120.00
Childs, Hays, Pa.	125.00
Chicago District	130.00
Western Utah	.....
California	.....
Super Duty Hays, Pa., Athens, Tex., Windham	137.00
Curtner, Calif.	155.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	20.00
Silica cement, net ton, bulk, Hays, Pa.	22.00
Silica cement, net ton, bulk, Chicago District, Ensley, Ala.	21.00
Silica cement, net ton, bulk, Utah and Calif.	.....

Chrome Brick — Per net ton

Standard chemically bonded, Balt.	$86.00
Standards chemically bonded, Curtner, Calif.	96.25
Burned, Balt.	80.00

Magnesite Brick

Standard Baltimore	$109.00
Chemically bonded, Baltimore	97.50

Grain Magnesite — St. ⅝-in., grains

Domestic, f.o.b. Baltimore in bulk fines removed	$64.40
Domestic, f.o.b. Chewalah, Wash., Luning, Nev. in bulk	38.00
in sacks	43.75

Dead Burned Dolomite — Per net ton

F.o.b. bulk, producing points in: Pa., W. Va., Ohio	$14.50
Midwest	15.10
Missouri Valley	13.65

FLUORSPAR

Washed gravel, f.o.b. Rosiclaire, Ill. Price, net ton; effective CaF_2 content.

72½%	$44.00
70% or more	42.50
60% or less	38.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.l.f. New York, ocean bags	11.25¢
Canadian sponge iron, Del'd in East, carloads	9.5¢ / 10.75¢
Domestic sponge iron, 98+% Fe, carload lots	9.5¢
Electrolytic iron, annealed, imported 99.5+% Fe	27.5¢
domestic 99.5+% Fe	36.5¢
Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe	53.5¢
Hydrogen reduced iron minus 300 mesh, 98+% Fe	62.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micron, 98%, 00.5+% Fe	83.0¢ to $1.45
Aluminum	31.5¢
Brass, 10 ton lots	29.50¢ to 36.50¢
Copper, electrolytic	51.50¢
Copper, reduced	51.50¢
Cadmium, 100-199 lb. 95¢ plus metal value	
Chromium, electrolytic, 99% min., and quality, del'd	$3.60
Lead	23.50¢
Manganese	57.0¢
Molybdenum, 99%	$2.75
Nickel, unannealed	89.50¢
Nickel, annealed	96.50¢
Nickel, spherical, unannealed	93.50¢
Silicon	43.50¢
Solder powder	7.0¢ to 9.5¢ plus met. value
Stainless steel, 302	91.0¢
Stainless steel, 316	$1.10
Tin	14.04¢ plus metal value
Tungsten, 99% (65 mesh)	$4.06
Zinc, 10 ton lots	17.5¢ to 25.0¢

Ferroalloy Prices

(Effective June 7, 1955)

Ferrochrome

Contract prices, cents per lb contained Cr, lump, bulk, carloads, del'd, 65-72% Cr, 2% max Si.

0.025% C .. 36.00	0.15% C ...	33.75
0.035% C, Simplex .. 34.50	0.20% C ...	33.50
	0.50% C ...	33.25
0.06% C ... 34.50	1.00% C ...	33.00
0.10% C ... 34.00	2.00% C ...	32.75
65-69% Cr, 4-9% C		24.75
62-66% Cr, 4-6% C, 6.9% Si		25.60

S. M. Ferrochrome

Contract prices, cents per pound, chromium contained, lump size, delivered.

High carbon type: 60.55% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads	25.85
Ton lots	28.00
Less ton lots	29.50

High Nitrogen Ferrochrome

Low-carbon type 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 3¢ for each additional 0.25% of N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C	$1.18
0.50% max. C	1.16
9 to 11% C	1.25

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed, lump 4-in. x down, 24.75¢ per lb contained Cr plus 12.00¢ per lb contained Si. Bulk 2-in. x down, 25.05¢ per lb contained Cr plus 10.80¢ per lb contained Si. Bulk 1-in. x down, 25.25¢ per lb contained Cr plus 11.00¢ per lb contained Si.

Calcium-Silicon

Contract price per lb of alloy, lump, delivered.

30-33% Cr, 60-65% Si, 3.00 max. Fe.

Carloads	19.00
Ton lots	22.10
Less ton lots	23.60

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	20.00
Ton lots	22.30
Less ton lots	23.30

SMZ

Contract prices, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.

Ton lots	17.50
Less ton lots	19.50

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.

Carload lots	16.60
Ton lots	18.10
Less ton lots	19.35

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	17.50
Ton lots to carload packed	18.50
Less ton lots	20.00

Ferromanganese

Maximum contract base price, f.o.b., lump size, base content 74 to 76 pct Mn.

Producing Point	Cents per-lb
Marietta, Ashtabula, O.; alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	9.50
Clairton, Pa.	9.50
Sheridan, Pa.	9.50
Philo, Ohio	9.50

Add or subtract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn:

Carloads, bulk	11.85
Ton lots packed	13.65

Spiegeleisen

Contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.

Manganese	Silicon	
16 to 19%	3% max.	$84.00
19 to 21%	3% max.	86.00
21 to 23%	3% max.	88.50
23 to 25%	3% max.	91.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	45.00
Ton lots	43.50

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

Carloads	30.00
Ton lots	32.00
250 to 1999 lb	34.00
Premium for hydrogen-removed metal	0.75

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn ..... 21.25¢

Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	32.00	33.85	35.05
0.07% max. C	29.95	31.80	33.80
0.15% max. C	28.45	30.30	31.50
0.30% max. C	26.95	28.80	30.00
0.50% max. C	26.45	28.30	29.50
0.75% max. C, 80-85% Mn, 5.0-7.0% Si	23.45	25.30	26.50

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢.

Carload bulk	11.00
Ton lots	12.65
Briquet contract basis carlots, bulk, delivered, per lb of briquet	12.45
Ton lots, packed	14.25

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $85.00 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $88.00. Add $1.00 per ton for each additional 0.50% Si up to and including 17%. Add $1.45 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, packed.

	Ton lots	Carloads
96% Si, 2% Fe	20.10	18.00
97% Si, 1% Fe	20.60	18.50

Silicon Briquets

Contract price, cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si briquets.

Carloads, bulk	6.55
Ton lots	8.35

Electric Ferrosilicon

Contract price, cents per lb contained Si, lump, bulk, carloads, delivered.

25% Si	20.00	75% Si	14.40
50% Si	12.00	85% Si	16.10
65% Si	13.50	90% Si	17.25

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Ferrovanadium

35-55% contract, basis, delivered, per pound, contained V.

Openhearth	$3.00-$3.10
Crucible	3.10- 3.20
High speed steel (Primos)	3.20- 3.25

Alsifer, 20% Al, 40% Si, 40% Fe,

Contract basis, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads	9.25¢
Ton lots	10.15

Calcium molybdate, 46.3-46.6%

f.o.b. Langeloth, Pa., per pound contained Mo $1.33

Ferrocolumbium, 50-60%, 2 in. x D contract basis, delivered per pound contained Cb.

Ton lots	$12.00
Less ton lots	13.05

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, contract basis, del'd, ton lots, 2-in. x D per lb cont'd Cb plus Ta.... $6.35

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo.. $1.46

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $4.00 unitage, per gross ton $90.00
10 tons to less carload $110.00

Ferrotitanium, 40% regular grade

0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.50
Less ton lots $1.55

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload, per net ton $177.00

Ferrotungsten, ¼ x down, packed, per pound contained W, ton lots, f.o.b. $3.80

Molybdic oxide, briquets, per lb contained Mo, f.o.b. Langeloth, Pa. $1.27
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.34

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per lb.

Carload, bulk, lump	15.50¢
Ton lots, packed lump	16.75¢
Less ton lots, lump, packed	17.25¢

Vanadium Pentoxide, 86 - 89% V_2O_5 contract basis, per pound contained V_2O_5 ..... $1.33

Zirconium, contract basis, per lb of alloy.

35-40%, f.o.b. freight allowed, ton lots	26.00¢
12-15%, del'd, lump, bulk-carloads	8.00¢

Boron Agents

Borosil, contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed. B, 3.14%, Si, 40-45%, per lb contained B.... $5.35

Bortam, f.o.b. Niagara Falls

Ton lots, per pound	45¢
Less ton lots, per pound	50¢

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-3%, C 4.5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.

Ton lots per pound ..... 10.00¢

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in., x D, Ton lots... $1.30
F.o.b. Wash., Pa.; 100 lb up

10 to 14% B	.85
14 to 19% B	1.20
19% min. B	1.50

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over

No. 1	$1.00
No. 6	65¢
No. 79	50¢

Manganese - Boron, 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C. 2 in. x D, del'd.

Ton lots	$1.46
Less ton lots	1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd, less ton lots $2.05

Silcaz, contract basis, delivered.

Ton lots ..... 45.00¢

HOW TO BUY V-BELTS

FOR MORE POWER AND LONGER LIFE

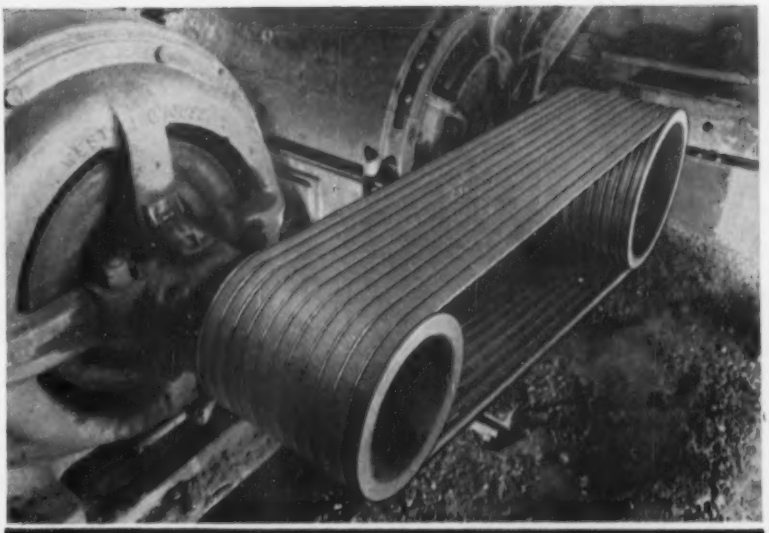
...and get "More Use per Dollar"

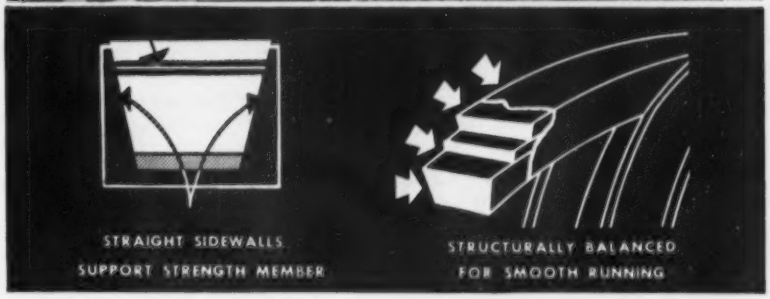
Look for a belt with straight sidewalls and accurately positioned strength members that prevent sag in the "power line".

The "power line" or pulling section is the heart of a V-belt. It is here the belt strength members are located and it sets the load-carrying capacity of the drive.

Straight sidewall construction assures firm pressure in the lower or compression section of the V-belt so that when it rounds the pulley it supports the strength member in a straight line. All cords of the strength member should pull equally. If they "sag", as in some constructions, the outer cords are overworked and premature failure results. In addition, straight sidewalls exert a firm side-grip on the sheave grooves, eliminate slip and power waste.

Specify, by name, the V-belt most carefully manufactured so that every part is balanced to deliver full horsepower capacity and "More Use per Dollar" . . . specify R/M Super-Power or standard Condor V-Belts.





R/M SUPER-POWER AND CONDOR V-BELTS

For longer life under shock loads, R/M Super-Power V-Belts have a new synthetic super strength member which delivers up to 40% more horsepower capacity; fewer belts can be used on the same drive for the same horsepower. They are oil-proof, non-spark and heat resistant. Both R/M Super-Power and standard Condor V-Belts have straight sidewalls with strength members micro-positioned and destretched during manufacture. This prevents power waste and frequent shutdown for belt take-up. Let an R/M representative show you why R/M Super-Power or Condor V-Belts last longer . . . give you "More Use per Dollar".

MANHATTAN RUBBER DIVISION—PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.

Other R/M products include: Industrial Rubber • Fan Belts • Radiator Hose • Brake Linings • Brake Blocks • Clutch Facings
Asbestos Textiles • Packings • Engineered Plastic, and Sintered Metal Products • Bowling Balls

PREMIUM PERFORMANCE BRINGS COSTS DOWN!

WHEELABRATOR® STEEL SHOT

COSTS 62% LESS

at HOOSIER IRON WORKS

MAINTENANCE COSTS ARE SLASHED, TOO

Abrasive costs per ton of castings cleaned were slashed from 75c to only 28c when Hoosier Iron Works, Kokomo, Ind., switched to Wheelabrator Steel Shot.

An additional saving was effected in the 15% to 33% longer life of wearable machine parts.

Manufactured under rigid control every step of the way, this premium electric furnace steel shot is made tough, hard and uniformly round. These properties make Wheelabrator Steel Shot last much longer, reducing abrasive costs. These same properties cut maintenance costs because they eliminate excessive machine-parts wear from sharp edges of broken shot.

Write for Bulletin 89B.

PERFORMANCE AT HOOSIER IRON WORKS

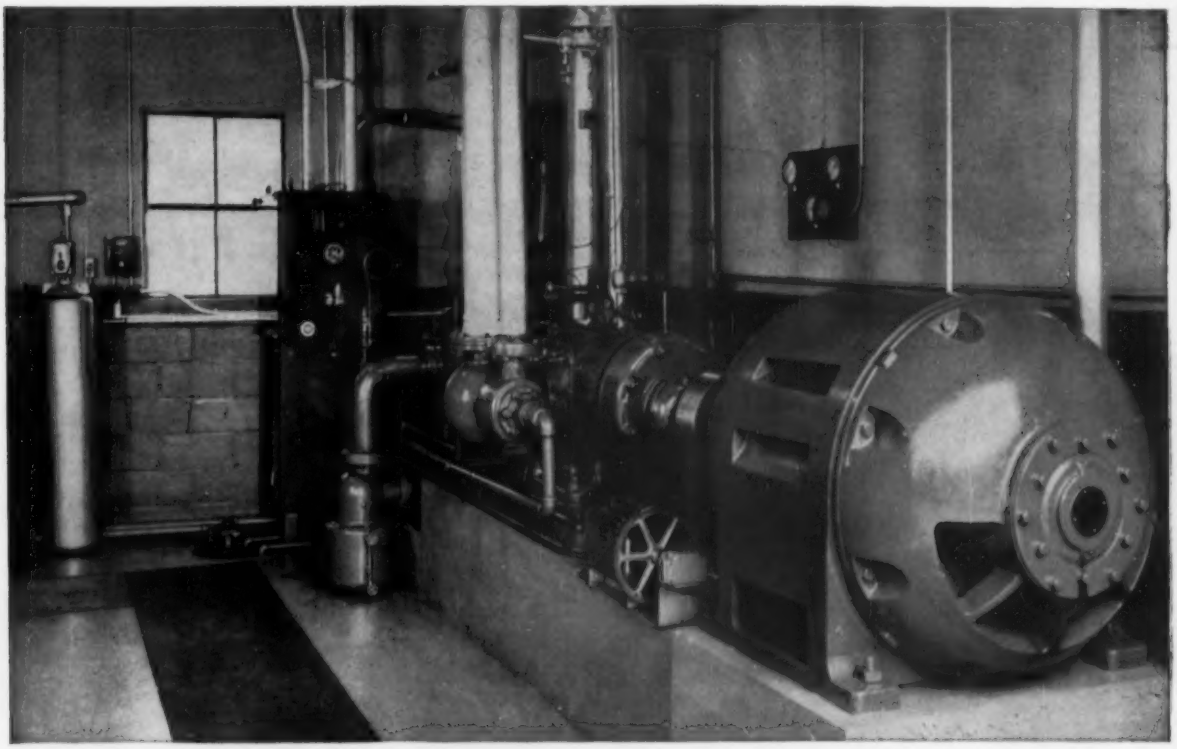
ABRASIVE	Chilled Iron Shot and Grit	Wheelabrator Steel Shot
Tons of Castings Cleaned	1018	1078
Pounds of Abrasive Consumed	13,400	2450
Cost of Abrasive Per Wheel Hour	$2.84	$1.07
Pounds of Abrasive Consumed Per Ton of Castings	13.2	2.3
Abrasive Cost Per Ton of Castings	75c	28c

note

Price alone does not determine cost. Although the original price of Wheelabrator Steel Shot is more than that of chilled iron its actual cost for Hoosier Iron Works is less than half. Premium performance brings costs down.

American **WHEELABRATOR®** *trail blazer of industrial progress*

AMERICAN WHEELABRATOR & EQUIPMENT CORP., 510 S. Byrkit St., Mishawaka, Indiana



reliable ***Air Power*** *supplied by a*

FULLER ROTARY COMPRESSOR AT EMPIRE STEEL CASTINGS, INC.

Compressed air, supplied by a Fuller Rotary Two-stage Compressor, is used for many foundry operations at Empire Steel Castings Company, Reading, Pa. This machine has a capacity of 680 c.f.m., 100-lb. pressure.

Many operations are mechanized, using compressed air. Pneumatic rammers; squeeze and jolt machines; automatic set-out and lifting in connection with mold conveyors; automatic shakeout; mold cleaning and spraying. Drying; core oven and core blowing. Chipping hammers and grinders; blacksmith requirements; sand blasting; and pressure testing—a whole group of operations simplified by the use of compressed air supplied by the Fuller Rotary Compressor.

After constant, day after day operation for one year, (approximately 4000 hours operating time) it was found, upon inspection, that this machine was in first-class condition in every respect—in fact, maintenance for the period was nil.

In your own operation, compressed air can save time and money . . . especially when it is supplied by reliably efficient Fuller Rotary Compressors. Don't overlook the advantages of air power—put it to work.

Fuller Rotaries are built for capacities to 3300 c.f.m., 125-lb. pressure. For complete information, write for Bulletin C-5A.

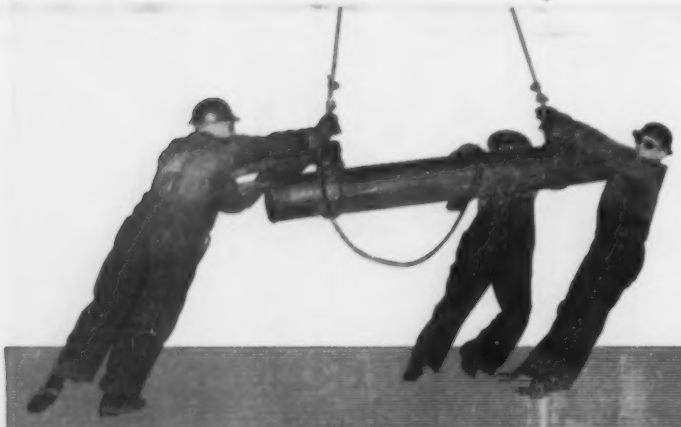
FULLER COMPANY—CATASAUQUA, PA.

Chicago • San Francisco • Los Angeles • Seattle • Birmingham

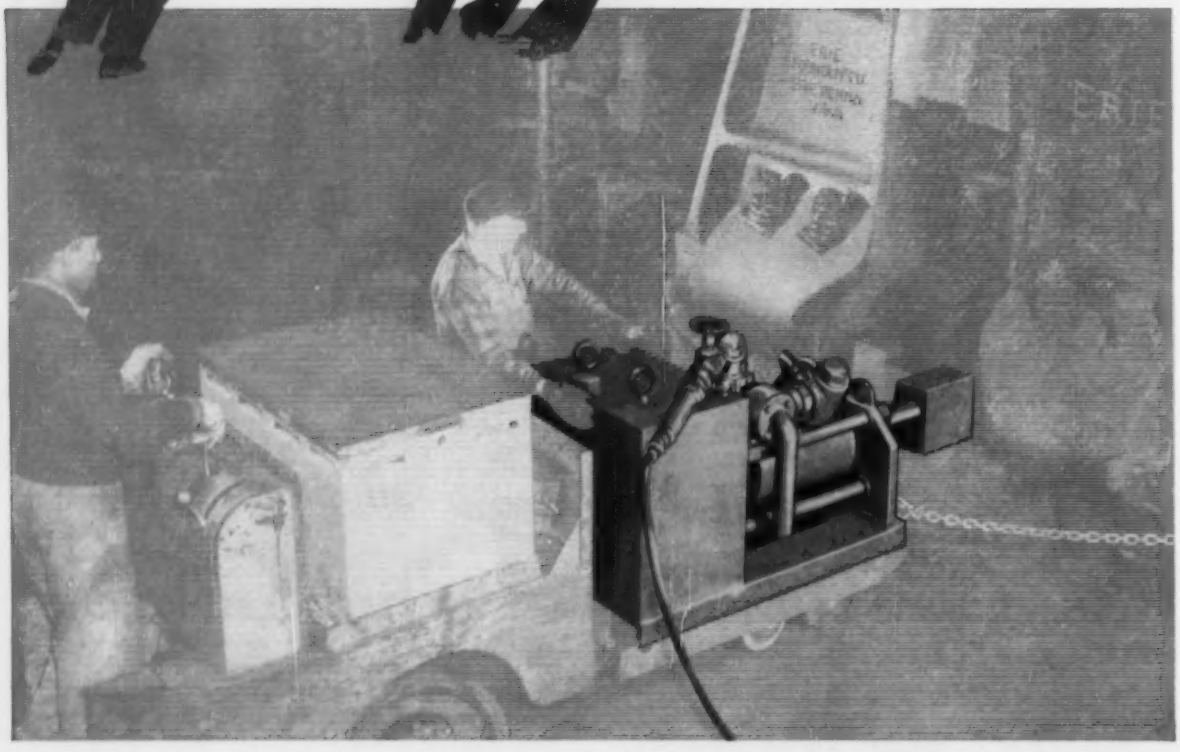
C-256
1283

Fuller

PIONEERS OF HIGH-EFFICIENCY VANE-TYPE ROTARY COMPRESSORS



IF YOU ARE STILL LOSING 20 MAN-HOURS DRIVING KEYS . . .



THE NEW ERIE KEY DRIVER

lets you drive keys safely . . . . . in one man-hour

STOP DRIVING A SPIKE WITH A TACK HAMMER!

Now, when driving die and sow block keys in forge hammers, the new Erie Key Driver will do with *two* men in *15* minutes what used to take *5* men (don't forget the crane operator) several hours! Let Erie Foundry Co. show you how to save maintenance man-hours, eliminate wasteful down time, reduce accidents.

THE NEW ERIE KEY DRIVER IS SAFE

There's no danger of ram end-swing, no glancing blows, minimum mushrooming of keys. Every Erie Key Driver blow is true. One user says,* "The incidence of personal injury and property damage has been reduced to a relatively negligible nature by using the very efficient Erie Key Driver."

**Name furnished upon request.*

Write for Bulletin No. 356 today

ERIE FOUNDRY CO. ERIE, PA.

THE GREATEST NAME IN FORGE HAMMERS

ERIE

Bale It the G-H Way...

Salvage Your Sheet Metal Scrap At Lowest Cost-per-Ton

For many years, leaders of U. S. industry have depended upon Galland-Henning Balers and Galland-Henning Counsel for profitable solution of their sheet metal salvage problems. If your plant generates an appreciable volume of sheet metal scrap per day, chances are that a G-H Baler of proper size and capacity will prove a profitable investment for you.

Galland-Henning Hydraulic Balers are powerful, rugged and fast. They are engineered and constructed with just one thought in mind . . . to produce dense, compact, mill-sized bales at lowest possible cost-per-ton. That means profitable scrap salvaging for you, and more good, usable scrap metal for the mills, smelters and foundries.

Make Galland-Henning your Headquarters for Competent Scrap Baling Counsel.

GALLAND-HENNING MFG. COMPANY
2725 SOUTH 31ST STREET • MILWAUKEE 46, WISCONSIN

GALLAND-HENNING
SCRAP METAL BALING PRESSES

A 7472-1P

THOMAS J. WATSON, JR. — *Portrait by Fabian Bachrach*

"IBM was one of the first companies to . . ."

"I have always been proud of the fact that IBM was one of the first companies to put into effect the Payroll Savings Plan for the purchase of United States Savings Bonds, and I am delighted to see this patriotic endeavor continuing year by year and increasing throughout our organization. Today thousands of IBM employees, through their participation in the Plan, are helping their country and providing for the future of their families and themselves." **THOMAS J. WATSON, JR.,** ***President International Business Machines Corporation***

If employee participation in *your* Payroll Savings Plan is less than 50% . . . or, if *your* employees do not now have the opportunity to build for their future through the systematic purchase of U.S. Savings Bonds . . . a letter to: Savings Bonds Division, U.S. Treasury Department, Washington, D. C., will bring prompt assistance from your State Director. He will be glad to help you put on a person-to-person canvass that will put an application blank in the hands of every employee. This is all you have to do. Your men and women will do the rest, because they will welcome the opportunity to build for personal and national security.

The United States Government does not pay for this advertising. The Treasury Department thanks, for their patriotic donation, the Advertising Council and

The **Iron Age**

LIKE FINDING GOLD!

That's the way it's been—for foundries that have changed to CUT STEEL during the past year. For this amazing, new type abrasive is *making money* for these foundries, by doing an incredibly better job of cleaning *and* drastically reducing cleaning costs. You see, CUT STEEL is actually *cut* from high quality, alloy steel—which gives it properties and advantages possessed by no other abrasive. If you haven't tested CUT STEEL in your cleaning room—you should! It's like finding gold!

Grade "A" CUT STEEL sells for less than most cast steel shot!
Grade "B" CUT STEEL costs no more than most malleable shot!

Sooner or later, you too, will change to CUT STEEL!

CUT STEEL
ABRASIVE

ANNEALSHOT and SUPER-ANNEALSHOT

PRODUCTS OF

METAL BLAST, INC.

872 EAST 67th STREET • CLEVELAND 3, OHIO

In its original form CUT STEEL resembles steel grit, with sharp edges and corners.

In usage, it rapidly changes to a spherical shape, in a wide variety of sizes.

RAILWAY EQUIPMENT FOR SALE

Used - As Is - Reconditioned

RAILWAY CARS

All Types

"SERVICE-TESTED"

FREIGHT CAR REPAIR PARTS

For All Types of Cars

LOCOMOTIVES

Diesel, Steam, Gasoline, Diesel-Electric

RAILWAY TANK CARS and STORAGE TANKS

6,000- 8,000- and 10,000-Gallon Cleaned and Tested

CRANES

Overhead and Locomotive

RAILS

New or Relaying

WANTED

30-Cubic Yard All-Steel, Automatic Drop Door, SIDE DUMP CARS

IRON & STEEL PRODUCTS, Inc.

General Office
13496 S. Brainard Ave.
Chicago 33, Illinois
Phone: Mitchell 6-1212

New York Office
50-b Church Street
New York 7, N. Y.
Phone: BEekman 3-8230

"ANYTHING containing IRON or STEEL"

THE CLEARING HOUSE

News of Used and Rebuilt Machinery

Pittsburgh Perks . . . Things are popping for the used and rebuilt machinery people. The strong April pickup has carried right through May with every line as good and in many cases better than during April.

The trend is still strongly in favor of the heavier equipment. Heavy machine tools, rolling mills and steel mill equipment are going stronger in May than in April, which was a very good month. Inquiries are higher for the most part and without exception the ratio of sales to inquiries is on the increase. Inquiries for heavy machine tools dropped off a little in late May but holidays and vacations make this normal.

The day of the small machine shop seems to be on the way out as the larger shops continue to buy heavily of large and newer equipment. These new, efficient plants are capable of doing larger volumes of work at prices below those of the smaller shops. One dealer in used machinery reported that he had liquidated two small shops within the last several weeks.

Despite this trend, business has been so good the past couple of months that some of the smaller shops are sharing in the boom. Sales of smaller machine tools have improved, but in general they are lagging far behind other types of used and rebuilt equipment.

Mills Roll . . . Rolling mills, shears and other steel mill equipment have picked up additional momentum during May following a very good volume of business in April. Inquiries have continued to climb and with it, sales ratios have increased at an even faster rate. The high level of steel operations has created a greater than expected demand for steel finishing facilities.

Crane business has held its own, but has not shared as big a gain as other equipment. Plenty of used cranes are reported on the market, but customers are seeking good prices plus many special specifications. This is particularly so on the larger cranes and dealers are finding it hard to fill buyers' needs.

Electrical machinery rebuilders are continuing along the same pattern set in April which turned out even better than expected. Inquiries were continuing at a very good pace and sales, particularly on heavier equipment, were made at a good healthy rate.

There is little doubt that the present activity will continue as strong for the next few months.

MDNA DIRECTORS at Cincinnati Convention are: (seated) R. M. Nathans, pres.; A. D. Lucas; R. Vinson, exec. dir.; R. W. Rice, treas.; D. Himoff; E. Pfeil; E. Stern; F. J. Lunney; J. T. Weiss; L. Botwinik; S. Danits; (standing) M. Wender; P. Connell; E. Watts; C. R. Kirby; R. D. Williams; T. J. O'Brien, 1st vice pres.; R. Strom; A. Borgman; C. Kempler; R. Vine; R. Bauer; C. Zvonar; B. Weiss, 2nd vice pres.; T. Johnston; R. Hood.

CONSIDER GOOD USED EQUIPMENT FIRST

ANGLE BENDING ROLL
4 x 4 x ½" Bertsch Angle Bending Roll, M.D.

BENDING ROLLS
8' x ¼" Bertsch Initial Type
9' x ⅝" Welsh 9L-2 Initial Type
12' x ⅜" Hilles & Jones Pyramid Type
14' x 1" Williams & White Pyramid Type
16' x ¼" Bertsch Initial Type Bending Roll
20' x 1" Hilles & Jones Pyramid Type Bending Roll

BRAKES—LEAF TYPE
8' x ⅛" Dreis & Krump Sins 186
12' x ⅜" Dreis & Krump, Motor Driven
16' x ⅛" Dreis & Krump No. 268

BRAKES—PRESS TYPE
12' All Steel Press Brake, 250 ton Capacity
Cincinnati All Steel Press Brake 10'x⅝"

CAR PULLER
Clyde Double Drum Electric Car Puller, Capacity 43,750# Max. Starting Pull

CRANES—OVERHEAD ELECTRIC TRAVELING

5 ton P&H Trav-Lift	20' Span 220/440 A.C.
5 ton Northern	57' Span 220/3/60 A.C.
5 ton Toledo	60' Span 230 Volt D.C.
5 ton Cleveland	90' Span 230 Volt D.C.
7½ ton Shepard-Niles	22' Span 220/3/60 A.C.
10 ton P&H	35' Span 230 Volt D.C.
10 ton Shaw	72' Span 230 Volt D.C.
15 ton OET	45' Span 220/3/60 A.C.
15 ton Shaw	72' Span 230 Volt D.C.
25 ton P&H With 5 ton Auxiliary	60' Span 230 Volt D.C.
30 ton Whiting	60' Span 230 Volt D.C.
50 ton Niles	60' Span 220/3/60 A.C.
125 ton Cleveland With 2 Trolleys 62½ ton & 10 ton Aux.	65' Span 220 Volt D.C.

DIEING MACHINE
25 ton Henry & Wright, 1⅛" Stroke, Double Roll Feed, Scrap Shear

DRAW BENCHES
50,000# Standard Double Draw, 48' Length of Draw
100,000# Poole Draw Bench, 39' Length of Draw

FORGING MACHINES
1", 1½", 2½" Acme
1", 1½", 2", 3", 4", 5" Ajax
5" National 7⅛" National—Air Clutch

FURNACE—MELTING
2 ton Whiting Hydro Arc, Top Charge

HAMMERS—BOARD DROP
3000 lb. Chambersburg Model J, Motor Driven
4000 lb. Chambersburg Model F
4000 & 5000 lb. Erie

HAMMERS — BOARD DROP — STEAM DROP — STEAM FORGING—800 lb. to 20,000 lb.

LEVELERS—ROLLER
53" Aetna Standard 17 Rolls 2⅛" Dia.
52" McKay 17 Rolls 4" Dia.
54" Aetna Standard 17 Rolls 6⅛" Dia.
60" Aetna Standard 17 Rolls 4⅛" Dia.
72" McKay 15 Rolls 4⅛" Dia.
76" Voss-Ungerer, 23 Work Rolls 2.165" Dia. Capacity 22 to 13 Gauge Mild Steel

PLATE EDGE PLANERS
36 ft. Southwark, Capacity 1⅛"
25 ft. Hilles & Jones, Capacity 1¼" Plate

PRESSES—HYDRAULIC
500 ton Wood 4-Columns, 24" Stroke, 72" x 96" Between Columns
1200 ton Birdsboro 4-Columns, 20" Stroke 30" x 36" Between Columns

PRESSES—INCLINABLE
#6½A Niagara, 150 ton, 12" Stroke
Cleveland, 125 ton, 12" Stroke

PRESSES—STRAIGHT SIDE
#304 Bliss, 8" Stroke
#308 Bliss, 255 ton, 14" Stroke
#8E Bliss, 200 ton, 16" Stroke, Bed Area 108"x60"

PRESS—TOGGLE
750 ton Bliss-Toledo Model 181-S Toggle Action Press, 42" Ram Stroke, 20" Blankholder Stroke, Bed Area LtoR 65", FtoB 60", Elect. Equip.

PUNCH & SHEAR COMBINATIONS
Style EF Cleveland, 36" Throat, Punch 1¼" thru 1" No. 2½ Buffalo Universal Ironworker
No. 1 Long & Allstatter Double End, Capacity Punch 1⅛" thru 1", Shear 2" Rd., 5x5x⅝" Angles
Style W Cleveland Single End, 60" Throat, 312 Ton With Attachment for Dishing Heads

ROLLING MILLS
8" x 12" Blake & Johnson Single Stand Two High
10" x 14" United Three Stand Two High
12" x 16" Waterbury Farrel Temper Mill
14" x 20" Farrel Birmingham
16" x 20" Waterbury Farrel Single Stand 2-High
20" x 36" Poole Two Stand Two High
32" x 58" Three High Breakdown Mill

ROLLS—PLATE STRAIGHTENING
51" Bertsch, 7 Rolls 10" Diameter
66" Bertsch, 7 Rolls 7" Diameter

SHEARS—GATE
48" x 1½" Mackintosh-Hemphill
80" x ⅝" Pels
90" x ⅝" Birdsboro

SHEARS—ANGLE
6x6x1" Long & Allstatter Size B
8x8x1" Long & Allstatter Size C

SHEAR—BAR
#9 Buffalo Bar Cutter, Capacity 3" Sq., 3⅝" Rd.

SHEAR—GUILLOTINE
#5 Hilles & Jones, Capacity 4⅛" Round, 6" Square

SHEAR—MISC.
Loewy Shear Line, Capacity 40" x ¼" Complete with Leveler, Conveyor, Coil Stand

SHEARS—ROTARY
3/16" Quickwork Rotary Shear, 36" Throat
¼" Kling #250, With Flanging Attachment
½" Quickwork Whiting #40A—NEW 1953
⅝" Kling #750, 48" Throat, Circle Cutting Attach.
1" Kling No. 100, 48" Throat, Joggling Rolls Incl.

SHEARS—SQUARING
72" x ⅛" Niagara No. K-6
10' x 10 Ga. Cincinnati
10' x ¼" Niagara No. 810
10' x 12 Ga. Niagara No. 510B
12' x ⅜" American
156" x ⅝" Birdsboro

SLITTERS
36" Yoder Slitting Line with Coilers
38" Paxson Coil & Sheet Slitter
28" Custom Built Slitting Line, with Coilers & Leveler

TESTING MACHINES
5,000 lb. Olsen Hydraulic LaCap Universal
2,000 lb. Riehle Model 1°8-2 Universal
10,000 lb. Tinius Olsen Universal
30,000 lb. Tinius Olsen Universal
50,000 lb. Baldwin Southwark Comp. Testing Machine
60,000 lb. Tinius Olsen Universal Hydraulic
100,000 lb. Tinius Olsen Universal
200,000 lb. Tinius Olsen Compression, Portable

TRIMMER
No. 438V Quickwork Whiting Stamping Trimmer

WELDER
200 KVA Progressive Univ. Seam Welder, 220 v. 60 cy.

WELDING POSITIONER
2500# Ransome Model 25-P—NEW 1950

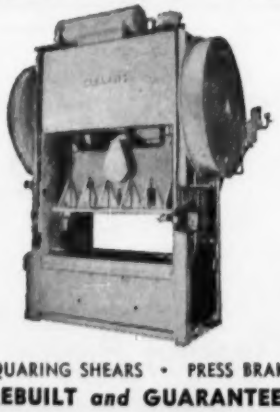
• Manufacturing **A. T. HENRY & COMPANY, INC.** Equipment •

50 CHURCH ST., NEW YORK CITY 8
Telephone COrtlandt 7 3437

Confidential Certified Appraisals
Liquidations — Bona Fide Auction Sales Arranged

Consulting Engineering Service
Surplus Mfg. Equipment Inventories Purchased

WORLD'S LARGEST STOCK
STAMPING PRESSES
BLISS • CLEARING • CLEVELAND
FERRACUTE • HAMILTON • L & J
NIAGARA • TOLEDO • V & O



SQUARING SHEARS • PRESS BRAKES
REBUILT *and* GUARANTEED

JOSEPH HYMAN & SONS
TIOGA, LIVINGSTON & ALMOND STS
PHILADELPHIA 34 PA. Phone REGENT 9-7727

FOR SALE
RADIAL DRILL—8' x 22" col. Cincinnati
SHAPER—22" Gamra. Plain. NEW 1949
LATHE—18" x 78" cc American, late model
WILLIAMS MACHINERY COMPANY
1060 Broad St. Newark 2, N. J.

2—#55 Buffalo Mill Type Open Throat Bar Shears, 6" Stroke, Capacity 275 Ton.
Plate Shear, "C", Long and Allstatter, 10'x½".
Plate Shear, Long and Allstatter, capacity 6' x 1".
Hilles and Jones and Buffalo Bar Shears, 1½", 2", 2½", 3", 3¼", 4" and 4¼".
Angle Shear, Double, 8" x 8" x 1".
Angle Shear, Double, 6" x 6" x ¾".
Kling No. 6 Bar & Billet Shear, 6" round.
2-A Williams White hydraulic tube bender, capacity 2".
4000 Lb. Niles Bement Double Frame Steam Forging Hammer.
1500 Lb., 3300 Lb. Chambersburg Single Leg Steam Forging Hammers.
Chambersburg Model J, motor drive, board drop hammer, 1000 lb.
Nazel Air Forging Hammers, #4-B, #5-N.
Williams White Bulldozers, #22, #3, #4, #25, #6, #29 U type.
Ajax Forging Rolls, from #1 to #4.
Ajax & National Upsetters, Suspended Slides, 1", 1½", 2", 3", 4".
Upsetting and Forging Machines. Not Suspended Slides, ¾", 1", 1½", 2", 2½", 3".
300-Ton Oilgear High Speed Hydraulic Press, 2-Column, ram 27" x 23".
600-Ton Verson Knuckle Joint Coining Press.
Landis Landmaco Threading machines with lead screws four spindle 1½", two spindle ⅝", two spindle 1", two spindle 1½".
Multiple Punch, Size G, L & A, 940 Ton.
Single and Double End Punches, various capacities and throat depths.

BOLT, NUT AND RIVET MACHINERY, COLD HEADERS, THREAD ROLLERS, THREADING MACHINES, TAPPERS, COLD BOLT TRIMMERS, SLOTTERS, HOT HEADERS AND TRIMMERS, COLD AND HOT PUNCH NUT MACHINES.

DONAHUE STEEL PRODUCTS CO.
1913 W. 74th Street, Chicago 36, Ill.

SELECT MACHINE TOOLS

BORING MACHINES
30" & 42" Bullard vertical turret lathes
No. 2 P. & W. Jig Borer, Model 1278.

DRILLING MACHINES
9' arm 16" col. American radial, H.D.
4' arm 13" col. Fosdick Hyd., new 1941.

GRINDING MACHINES
16" x 120" Landis gap type cyl. grinder, hyd.
40" No. 16A2 Blanchard 2-spd., rotary, new 1948.
72" Colonial broach grinder, Late
72" Hanchett 3-spd. rotary surface, new 1948.
8" x 18" Landis cyl., 30 deg. 4 Head, 1941.
10" x 96" Landis gap type cylindrical, new 1941.

LATHES
No. 5 Jones & Lamson ram type univ. turret (2) late.
14" x 6' Hendey Toolroom, 1946.
15" x 30" Lips Carbo-Matic, 1942.
9" x 18" Hendey Prec., Tool & Gauge, 1940.

MILLS
1-18 Cincinnati production.
No. 2 Kearney & Trecker plain.
1-2-3-4-5-6 knee type plain & vertical.
42" x 42" x 18' Ingersoll adj. planer type.
60" x 48" x 16' Ingersoll adj. rail planer type.
No. 2H K & T plain horiz., new 1942.

PLANERS
36" & 96" Rockford Hyd. Openside Shaper-Planers
48"x48"x10' Gray Maxi-Service
72"x48"x14' Liberty Openside

PRESSES
150 ton No. 13-1 Cleveland OBI, late type.
500 ton No. 1009 Hamilton D.C., adj. bed, 60" x 102".
400 ton No. 603 Toledo K-J coining or embossing
845 ton No. H3612½ Hamilton Forging Press.
1000 ton No. 606 Toledo coining or forging.
600 ton Minster K-J Coining, 1941.

SHAPERS
6" Pratt & Whitney vertical, Late
24" G & E Hi-Duty universal
32" G & E Invincible, F.M.D., late type.

UPSETTERS
1½" Natl. susp. slides, auto-lub, guided ram.
1½" Ajax, suspended slides, steel forms.
5" Ajax, suspended slides, steel frame.

1000 Tools in Stock
Free Illustrated Catalog

MILES MACHINERY CO.
Phone Saginaw 2-3105
2041 E. Genesee Ave. Saginaw, Mich.

eastern Rebuilt Machine Tools

THE SIGN OF QUALITY—THE MARK OF DEPENDABILITY

UPRIGHT DRILLS

D4 Colburn, m.d.
D6 Colburn Heavy Duty, m.d.
20" Cincinnati Bickford Super-Service Prod. Drill, m.d.
24" Aurora, m.d.
24" Cincinnati-Bickford, m.d.
32" Aurora, belt drive
36" Cincinnati Bickford, belt drive
No. 2 Colburn Mfg. Type, m.d.
No. 315 Baker Heavy Duty, s.p.d.
No. 417 Baker, m.d., later type
No. 513 Baker, m.d.
#4-48" Defiance Machine Co. Drill, m.d.

HORIZONTAL DRILLS

3 way Natco Horizontal Drill, consisting of 3 E13 Holeunits
No. 1½8x30" Pratt & Whitney 2 spindle Deep Hole Reaming Machine, m.d.
No. 1½8x50" Pratt & Whitney Gun Barrel Rifling Machine, m.d., latest
No. 18x74" Pratt & Whitney 2 spindle Deep Hole Reaming Machine m.d.
No. 1½x105" Pratt & Whitney 2 spindle Gun Barrel Rifling Machine, m.d.
No. 1 Pratt & Whitney 2 spindle Deep Hole Drill, belted m.d.
Model 410 W.F. & John Barnes 2 spindle Hydraulic Deep Hole Drill, m.d.

MULTIPLE SPINDLE DRILLS

3 spindle 24" Barnes All Geared Self-Oiling, m.d.
#115U Moline Multiple Spindle Drill Press
No. 3 Baush, m.d., 16x30" head
No. 3 Baush, m.d., 20x40" head
3 spindle 28" Cinti. Bickford Upright Drill, m.d., No. 4 M.T.
4 spindle Niles-Bement-Pond, m.d., 12' rail, No. 5 Taper
No. 924 Barnes Vertical Drilling, Boring & Facing & Reaming Machine
6 spindle W.F. & John Barnes Vertical Drilling Machine, m.d.
No. 16 Foote Burt Fixed Center, m.d.
3 spindle Rockford 12" Gang Drill, m.d.

We carry an average stock of 2,000 machines in our 11 acre plant at Cincinnati. Visitors welcome at all times.

THE EASTERN MACHINERY COMPANY
1002 Tennessee Avenue, Cincinnati 29, Ohio
MElrose 1241 CABLE ADDRESS—EMCO

#61A Fellows Gear Shaper Serial #21252
Late Type 12" x 48" Landis Type C Universal Hydraulic Cylindrical Grinder Ser. #17008
72" Niles Bement Pond Vertical Boring and Turning Mill—Reconditioned
54" Bullard Serial #11456
#72A3 Heald Sizematic Internal Grinder — Serial #12276 — Reconditioned and guaranteed
7A Jones & Lamson Turret Lathe Serial #80459
(2) Greenfield #2B Hydraulic Internal Grinder Serial #1-11-11002 and F4-11235
#47 Heald Single End Borematic Serial #4646
DB 2112-A Excello Single End Borematic Ser. #10100
42" Bullard Vertical Turret Lathe Serial #14091
#300 Hanchett Vertical Surface Grinder Ser. #300-17
2-3-4 Spindle Leland Gifford Drills
#2B Brown & Sharpe Standard Plain Horizontal Milling Machine Serial #4107
24" Bullard Vertical Boring Mill—Spiral Drive Serial #15000

HAZARD BROWNELL MACHINE TOOLS, INC.
350 Waterman St. Providence 6, R. I.

COLD ROLLING MILLS
16" by 20" Farrel, 150 HP drive
12" by 14" W. F., 200 HP drive
10" by 10" US Mint, 50 HP DC.
3" by 5" Ruesch Lab. Mill, 3 HP
F. H. CRAWFORD & CO., INC.
30 Church St., New York 7, N. Y.

FOR SALE
BENDING ROLL
14' X 1" cap. WILLIAMS & WHITE
AIR OPER. DROP END—60 HP.
NEW 1945—EXCELLENT COND.
Republic MACHINERY COMPANY
THOS. J. O'BRIEN, PRES.
134 N. 3RD ST. PHILA. 6, PA.
Walnut 3-6813

SHAPE STRAIGHTENER
NO. 2B 13-ROLL
KANE & ROACH
Side Adjustment
Cap. 4½" On Edge, 8½" Flat
A. C. Motor & Controls
LIKE NEW
LANG MACHINERY COMPANY
28th St. & A.V.R.R. Pittsburgh 22, Pa.

KNOX
REBUILT
AIR COMPRESSORS
FULLY GUARANTEED
EARL E. KNOX COMPANY
1111 BACON STREET ERIE, PA

BENNETT MACHINERY CO.
1—84" KING VERT. BOR. MILL
New 1943—3 Hds.; 88" swing, 60" ram travel; 70" under rail, wt. 98000 lbs.
(Send for list of 200 stock tools)
375 Allwood Rd., Clifton, New Jersey
Phone PRescott 9-8996 N. Y. Phone LOngacre 3-1227

LATE MODEL FORGING EQUIPMENT—USED
FOR SALE
1—4500-ton Baldwin Lima Hamilton Press
3—Baldwin Presses 1257-500-500 tons
1—500-ton HPM Press—Rebuilt
2—5" National Upsetters
1—4" National Upsetter
1—#2 National Maxipress
1—Gas Machinery Co. 19' Rotary Furnace
8—Phila. Coppersmithing Slot Furnaces
ADDRESS BOX C-967
Care *The Iron Age*, 100 E. 42nd St., New York 17

IMMEDIATE DELIVERY
FERRACUTE SD-703 Double Action Toggle Draw Press 700 Ton Cap., Bed Area 60" F.B. x 72" L.R. Stroke of Plunger 40", Stroke of Blankholder 20", 100 H.P. Motor.
BLISS No. 88 Straight Side Single Crank Press, Capacity 255 tons, Bed Area 30" & 29", 18" Stroke of Slide, Marquette Air Cushion.
TOLEDO Double Cranks, Nos. 91-42, 92C.
CLEVELAND Double Cranks, 45-G-72, 45-D-60
NIAGARA Double Cranks, 67C, 69BX.
BLISS Nos. 4, 22K, and 24K Knuckle Joint Presses.
"If it's machinery we have it."
NATIONAL MACHINERY EXCHANGE
128 Mott St. New York 13, N. Y.
CAnal 6-2470

Buying?
Selling?
The Clearing House serves both buyers and sellers.

BRAKE
Approx. ⅛ Capacity
Motor on Ram Friction Clutch
Power Press brake 10 ft. between uprights, bed 11 ft. Approx. $2000.00 in Dies. Good condition. Bargain. Picture on request.
JOHN G. GARNER
10002 E. Emory St., Grosse Pointe Woods, Mich. Tuxedo 1-2552

4A WARNER & SWASEY Universal Turret Lathe. Cross Sliding Turret; 8" capacity; Timken Bearing; 25 HP. 3/60/220/440. Late Type.
FALK MACHINERY COMPANY
18 Ward St. Baker 5887 Rochester 5, N. Y.

No. 4 B & S Automatic, M.D.
Gleason 3" Str. Bevel Gear Gen.
Fellows No. 8M Rod Liner.
No. 3A B & S Universal Mill.
D. E. DONY MACHINERY CO.
4357 St. Paul Blvd. Rochester 17, N. Y.

WORLD'S LARGEST INVENTORY
FREE CATALOG
MOTORS—GENERATORS—TRANSFORMERS
New and Guaranteed Rebuilt
1 H.P. to 2500 H.P.
ELECTRIC EQUIPMENT CO.
P. O. BOX 51, ROCHESTER 1, N.Y.

THE CLEARING HOUSE

ROLLING MILLS—STEEL WORKS EQUIPMENT

1—34" & 22" x 112" 3-HIGH PLATE MILL with front and back tilting tables, 1500 HP motor and gear set; also 84" 3-high jump mill on same drive, with tables.
1—34" x 22" x 100" 3-HIGH PLATE MILL with 3000 HP motor drive, vertical edger, two tilting tables.
3—4-HIGH HOT STRIP MILL STANDS for up to 76" width.
3—4-HIGH HOT STRIP MILL STANDS for up to 48" width.
1—24" BAR MILL, 3-HIGH, 3 stands, with variable speed D.C. motor, traveling tilting tables, roller tables, saws, bloom shear, furnaces.
1—18" BAR MILL, 3-HIGH, single stand, with drive motor, tables, billet heating furnace, etc.
3—18" BAR MILL ROLL STANDS, 3-HIGH, liner type housing with removable top.
1—4-HIGH TANDEM COLD MILL, 4 stands, for strip up to 38".
1—4-HIGH SINGLE STAND COLD MILL for strip up to 14" wide, 200 HP motor, 400/800 RPM.
1—12" x 16" COLD MILL, 2-high.
1—10" x 16" TANDEM COLD MILL, 2-high, 3 stands.
1—76" BACKED-UP ROLLER LEVELLER
1—STRAIGHTENER for bars from ¼" to 1½" dia.
1—34" x 192" ROLL GRINDER with motors and controls.
1—44" ROLL LATHE, enclosed headstock, tailstock, piano rest, 20 HP 500/1500 RPM, 230 volts D.C. motor and control.
2—PACK FURNACES for hot sheet mills, 42" x 60", double chamber.
1—STAMCO #6 CORRUGATING MACHINE for sheets, removable dies.
1—FLYING SHEAR with capacity up to 4" square, 9' to 30' lengths, at 600' per minute; with controls and 40' roller table.
1—FLYING SHEAR, Rendleman type, for bars.
1—PLATE SHEAR, capacity 9/16" x 156".
—DRAWBENCHES, 100,000 lb., 50,000 lb., 30,000 lb. capacities.
1—COKE OVEN PUSHER, used very little, excellent condition.
1—BILLETEER, Bonnot-Lentz Size "C", maximum size 13" square x 18'.
4—SCALPING MACHINES for ingots and billets.
1—125-TON LADLE CRANE, 25-ton auxiliary, 50' span.
1—2000 HP MOTOR, 600 RPM, 6600/3/60.
1—1500 HP MOTOR, 595 RPM, 2200/3/60.
1—1800 HP GEAR DRIVE, ratio 19 to 1.
1—500 HP GEAR DRIVE, ratio 7.63 to 1.
1—SCRAP BALER, box size 84" x 18" x 36".
4—TINNING UNITS for hot dipped tin plate.

FRANK B. FOSTER, INC.

2220 Oliver Building, Pittsburgh 22, Pa.
Cable: "Foster Pittsburgh" Telephone ATlantic 1-2780

REBUILT—GUARANTEED ELECTRICAL EQUIPMENT

SLIP RING MOTORS

Constant Duty, 3-phase, 60 cycle

Qu.	H.P.	Make	Type	Volts	R.P.M.
1	2000	G.E.	MT-12	6600	600
1	1250	Whse.	C.W.	6600	593
1	1200/1500	G.E.	MT-498	2300	357
1	750	G.E.	I-M	2200	400
1	600	G.E.	MT	2300	585
1	600	Whse.	C.W.	2200	444
1	600	G.E.	MT-20	2300	360
1	500	Al. Ch.	ANY	2200	505
3	500	G.E.	I-M	2300	450
3	400	G.E.	I-17-M	2300	875
1	400	G.E.	MT-424	450	360
1	400	Al. Ch.	ANY	2300	505
1	400	G.E.	MT-412	2200	440
1	300	G.E.	I-17-M	2300	580
1	250	G.E.	M-6335-B	2300	1200
1	250	Whse.	CW-987	440	1200
1	250	Al. Ch.	ANY	440	705
1	250	Whse.	CW	2200	450
1	250	G.E.	MT-414	2300	300
1	200	Whse.	CW	440	600
1	150	Al. Ch.	ANY	440	705
1	150	Al. Ch.	ANY	2200	600
2	150	G.E.	I-17-M	440	450
1	125	G.E.	I-15-M	2300	600
1	100	G.E.	I-14-M	2200	720
1	104	Whse.	CW	440	870

SYNCHRONOUS MOTORS

3-Phase, 60-Cycle

Qu.	H.P.	Make	P.F.	Volts	R.P.M.
2	2100	G.E.	100	2300	360
2	2000	G.E.	80	2200	720
1	1750	G.E.	100	2200	360
1	1000	Whse.	80	2300	360
1	1000	Whse.	80	2300	225
1	800	El. Mchy.	80	440	1200
1	750	G.E.	80	2300	450
2	700	G.E.	80	2300	1200
1	710	G.E.	80	2300	720
1	250	G.E.	80	440	450
1	250	G.E.	100	2300	514
2	200	Whse.	80	440	1200
1	187	G.E.	80	440	720
1	150	G.E.	100	2200	900
1	150	G.E.	100	550	600
1	150	Whse.	80	440	450
2	135	G.E.	80	4600/2200	1200
3	125	El. Mchy.	100	4800/2400	900
1	125	G.E.	80	2300	900
2	100	Whse.	80	440	1800
1	100	Ideal	80	440	900
2	100	G.E.	80	440	600
1	100	El. Mchy.	100	440	360

T. B. MAC CABE COMPANY
4302 Clarissa St., Philadelphia 40, Penna.
Cable Address: "Mactool" Philadelphia, Pa. Phone: Devonport 4-8300

FOR SALE

Freight car repair parts
Relaying rails
Steel storage tanks
Freight cars and Locomotives

ALSO

2—42" Bullard Spiral Drive Vertical Turret Lathes—1944
1—42" Bullard Vertical Turret Lathe, New Era Contracting Equipment Cranes — Tractors Ditchers — Compressors Diesel Engines and Generating Sets

THE PURDY COMPANY
8754 S. Dobson Ave.
Chicago 19, Illinois
St. Louis, Mo. So. San Francisco, Calif.
Los Angeles, Calif.

RE-NU-BILT
GUARANTEED
ELECTRIC POWER EQUIPMENT
A. C. MOTORS
3 phase—60 cycle

SLIP RING

Qu.	H.P.	Make	Type	Volts	Speed
1	1500	G.E.	MT-498	2300	360
1	1500	ABB		2300	720
2	1000	A.C.	Mill	2300	240
1	800	G.E.	MT	2300	293
1	750	A.C.		2300	600
1	500	G.E.	M-574Y	6000	900
1	500	G.E.	MT-412	2200	580
1	500	Whse.	CW	550	350
1	400	Whse.	CW-960A	440	1170
1	400	Whse.	CW	440	514
1	400	Whse.	CW-1213	2200	435
1	350	G.E.	MT-442Y	2300/4000	253
2	350	G.E.	IM-17A	440/2200	720
1	250	G.E.	MT-424Y	4600	257
1	250	G.E.	MT-559B	2200	1800
1	250	Al. Ch.		550	600
1	200	Cr. Wh.	26QB	440	505
1	200	G.E.	IM	440	435
1	150 (unused)	Whse.	CW	2300	435
2	125	A.C.		440	865
1	125	Al. Ch.		440	720
1	100	G.E.	IM-16	2200	435
1	100	G.E.	IM	440	600
4	100	A.C.	ANY	440	695

SQUIRREL CAGE

2	650	G.E.	FT-556RY	440	3570
1	500	G.E.	K-6345-B	2300	1185
8	450	Whse.	CS-1426	2300/4150	854
1	400	G.E.	IE-15B	2200	1165
1	400	G.E.	IK	2300	500
1	200	G.E.	IK-17	440	580
3	200	G.E.	KT-557	440	1800
1	150/75	G.E.	IK	440/900/450	
1	150	Whse.	CS-8568	440	880
1	150	Whse.	CS	440	580
2	125	Al. Ch.	ARW	2300	1750
1	100	Whse.	CS-876C-TEFC	440	710

SYNCHRONOUS

1	4350	C.W.	3501-8L	13800/6900	514
2	2100	G.E.	ATI	2300	360
2	2000	Whse.		2300	150
2	1750	G.E.	ATI	2300	3600
3	735	G.E.	ATI	2300/12000	600
1	500	Ideal	SM	2300/4160	1800
2	500	G.E.	TS-7567	2200	1200
1	450	Whse.		2300	128.5
1	450	Whse.		2300	450
1	400	G.E.	TS-7585	2300	1200
1	400	G.E.	TS	2200	480

BELYEA COMPANY, INC.
47 Howell Street, Jersey City 6, N. J.

FOR SALE

10—Koppel and Western 30 cu. yd. Air Dump Cars. Lift type doors with side aprons. All steel. Bargain.
80 ton General Electric diesel electric locomotive 500 HP Cummins engines. Built 1947.
80 ton Whitcomb diesel electric locomotive 500 HP Cummins engines. Rebuilt.
44 ton General Electric diesel electric locomotive 380 HP Caterpillar engs. 4 motor type.

Mississippi Valley Equipment Co.
501 Locust St. St. Louis 1, Mo.

LAND
EST. 1910
ELECTRICAL EQUIPMENT
A.C. & D.C.
MOTORS AND GENERATORS
One of America's Largest Stocks
RELIABLY REBUILT IN OUR OWN SHOP
1 YEAR GUARANTEE
Send us your inquiries
L. J. LAND INC.
150 GRAND ST., NEW YORK 13, N. Y.
Phone: CAnal 6-6976

SQUIRREL CAGE
MOTORS
3 phase, 60 cycle, 220 or 440 volts
(*2300 volts or higher)

HP	Make	Type	Speed
1250	*Al.-Ch.	ANW	3600
800	*Westg.	CS	3600
700	*Westg.	CS	1200
500	G. E.	KT-4"4	450
350	*G. E.	K-6344Y	1200
300	G. E.	KT-556B	1800
250	*L.-Allis	DGK-148	720
250	G. E.	IK-17A	600
200	West.	CS-14	514
200	*G. E.	FT-548Y	3600
200	*Cr. Wh.	8C	900
200	Al.-Ch.	ARWWT	600
150	Westg.	CS-772B	1200
150	Wagner	RP2-31V	900

CHICAGO ELECTRIC CO.
1335 W. Cermak Rd., Chicago 8, Ill.

TRACK SUPPLIES — RAILS

New **RAILS** *Relaying*

TRACKWORK of all KINDS

LIGHT RAILS—12# TO 60#—20'0" & 30'0"
HEAVY RAILS—60# TO 100#—30'0" & 33'0"
JOINT BARS, BOLTS, TIE PLATES, SPIKES & TOOLS, FROGS, SWITCHES, STANDARD & SPECIAL TRACKWORK.

SEND US YOUR INQUIRIES

KASLE STEEL CORPORATION

BOX 536 ROOSEVELT PARK ANNEX, DETROIT 32, MICH.—PHONE TIFFANY 6-4100

ALSO IN STOCK
STEEL
SHEETS & PLATES
STRUCTURALS
and Aluminum Products

RAILS
FOR IMMEDIATE DELIVERY

500 Tons 80# ASCE	Relay
400 Tons 90# ARA-B	Relay
150 Tons 90# ASCE	Relay

TIE PLATES • Excellent Relay
TURNOUTS—LIGHT RAILS
TRACK ACCESSORIES

MORRISON
RAILWAY SUPPLY CORP.
814 Rand Bldg. Buffalo 3, N. Y.
MOhawk 5820

OVERHEAD CRANES

5-ton NEW P&H 48'6" span, 3-motor, 230 VDC cab.
2—7½-ton Shaw, 67'1" and 66'8" span, 3-motor 230 VDC cab.
2—10-ton Shaw, 67'1" span, 3-motor, 230 VDC cab.
1—20-ton Morgan, 4-motor, 5-ton aux., 68'7" span, 230 VDC cab.
1—35-ton Northern, 5-ton aux., 75'0" span, 220/-3/60 cy. cab.
1—75-ton Morgan Ladle Crane, 25 ton aux. 4 girder 49'6" span, 230 VDC cab.
100 other cranes—various tonnages, spans and current.

SEND ME YOUR CRANE INQUIRIES

JAMES P. ARMEL—Crane Specialist
710 House Bldg. Pittsburgh 22, Pa.
Telephone: Gr. 1-4449

CRANES
BOUGHT & SOLD
ENGINEERED TO YOUR REQUIREMENTS
Ornitz Equipment Corp.
Industrial Engineering Service
220 3rd Ave. Brooklyn 17, N. Y.
TRiangle 5-2553

USED MILD PLATES

Excellent condition. Various sizes from 3/16" to 1.00"

FREIGHT CARS
CAR PARTS, RAILS

Consolidated Ry. Equipment Co.
105 S. La Salle St., Chicago 3, Ill.

USED RAILROAD EQUIPMENT

CAR PARTS
LOCOMOTIVES
TANK CARS
BOX CARS

HYMAN-MICHAELS CO.
122 S. MICHIGAN AVE., CHICAGO 3, ILL.

PRIME PLATES
F.O.B. PITTSBURGH
Type-M Mill Papers Avail.

1 ea.	7,650#	¾" x 100" x 29'11"
1 ea.	1,995#	2¼" x 24" x 10'7"
1 ea.	17,800#	2½" x 100" x 20'6"
1 ea.	11,200#	3" x 48" x 23'7"
1 ea.	10,700#	3" x 48" x 21'
1 ea.	17,000#	4" x 100" x 12'
1 ea.	20,010#	5⅛" x 66" x 17'
1 ea.	16,100#	6½" x 72" x 10'
1 ea.	4,630#	¾" x 72" x 25'
1 ea.	36,380#	9½" x 98" x 11'4"

Dubin Steel Co., 1015 Chestnut St.
Philadelphia 7, Pennsylvania

LIFTING MAGNETS

A complete magnet service. Magnets, new & rebuilt, generators, controllers, reels, etc.
Magnet specialists since 1910

Goodman Electric Machinery Co.
1060 Broad St. Newark 2, N. J.

Buying?
Selling?
The Clearing House serves both buyers and sellers.

MACHINES FOR YOUR YARD

Koehring 1¼ yd. Diesel crawler crane.
Link Belt ¾ yd. magnet crane.
7½ KW generator, drop switch, etc.
Eagle coal crusher.
Simplicity 2x6 screen.
Clayton-Kerrick steam cleaner.

TRACTOR & EQUIPMENT CO.
10006 Southwest Highway, Oak Lawn, Ill.

New **RAILS** *Relaying*

We carry frogs, switches, spikes and bolts in stock and most all sections of rails and track accessories.

M. K. FRANK
480 Lexington Ave., New York, N. Y.
Park Building, Pittsburgh, Pa.
105 Lake St., Reno, Nevada

OFFERING

BRIDGE CRANES

ARNOLD HUGHES COMPANY
765 Penobscot Bldg. Detroit, Mich.
WOodward 1-1894

Locomotive Cranes, Diesel, Gas, Steam, Electric Power
Locomotives, Standard and Narrow Gauge
Gantry, Rubber mounted and crawler cranes
Derricks & Hoists
125 TON LOCOMOTIVE DIESEL ELEC. 1000 H.P.
3 drum American Hoist, 140000# SLP, Model 140

STONE, THE CRANE MAN
1132 Prudential Bldg., Buffalo 2, N. Y. Mohawk 4494

New **RAILS** *Relaying*

Railway Track Accessories

STANDARD IRON & STEEL CO.
Office & Yards: Knoxville, Tennessee

These are the rates that apply for space in the

Clearing House Section
Equipment and Materials Wanted Section
Contract Manufacturing Section
Business Opportunities Section

	1 Time	3 Times	6 Times	12 Times	24 Times	52 Times
1 inch	$ 12.25	$ 11.55	$ 10.95	$ 10.20	$ 9.60	$ 9.00
2 inches	23.75	21.90	20.40	19.20	18.00	17.20
3 inches	34.55	32.85	30.60	27.00	27.00	26.00
4 inches	46.10	40.80	38.40	36.00	34.55	32.65
5 inches	57.60	51.00	45.00	45.00	43.20	40.80
6 inches	65.50	61.20	54.00	54.00	51.85	48.95
8 inches	87.35	76.80	72.00	69.15	65.30	60.85
10 inches	110.00	90.00	90.00	86.35	82.00	76.00
15 inches	153.00	135.00	129.50	122.50	114.00	108.00
30 inches (Full Page)	270.00	259.00	245.00	228.00	216.00	204.00

EQUIPMENT AND MATERIALS WANTED

WEISS STEEL CO. INC.
600 WEST JACKSON BLVD.
CHICAGO 6, ILLINOIS
Buyers of Surplus Steel Inventories
36 Years of Steel Service

WE BUY AND SELL USED
OVERHEAD TRAVELING CRANES
STRUCTURAL BUILDINGS
Your Offerings and Inquiries Solicited
BENKART STEEL & SUPPLY CO.
CORAOPOLIS, PA.

WANTED
One electric arc steel making furnace, 1-2 tons nominal capacity with or without transformer and auxiliary equipment.
Also steel making induction furnace with nominal capacity of 100-300 lbs.
Specify condition, age, and price.
Address replies to:
Vanadium Corporation of America
Bridge Station
Niagara Falls, New York
Attention:
Mr. R. A. Davidson, Chief Engineer

1" Acme upsetter or header.
Will consider older type.
ADDRESS BOX S-19
c/o *The Iron Age*, 1016 National City Bank Building
629 Euclid Avenue, Cleveland 14, Ohio

WANTED
BRIDGE CRANES
ARNOLD HUGHES COMPANY
765 PENOBSCOT BLDG. DETROIT, MICH.
WOodward 1-1894

Want to clean house?
Use The Clearing House

WANTED
SURPLUS STEEL
WALLACK BROTHERS
7400 S. Damen Ave. Chicago 36, Illinois

WANTED
Model "L" Chambersburg Ceco Stamp Hammer, All Sizes.
ADDRESS BOX C-961
Care *The Iron Age*, 100 E. 42nd St., New York 17

BUSINESS OPPORTUNITIES

Have you any factories or plant sites to sell? This space would place you in touch with interested parties, as over 100,000 men read
THE IRON AGE

WANTED
Top flight Executive Vice President, willing to make a substantial investment in an old established very profitable steel plate fabricating plant. Must be well qualified in all phases of the business. Good qualifications will put you in line for President within two years or sooner.
ADDRESS BOX C-946
Care *The Iron Age*, 100 E. 42nd St., New York 17

EMPLOYMENT EXCHANGE

The meeting place for employers and men qualified for positions in the metalworking industry.

HELP WANTED

SALES MANAGER
METAL STAMPINGS

Graduate Sales Engineer to manage sales division of large metal stamping plant producing for manufacturers of appliances, automotive items, jet engine parts, etc. Require outstanding man with proven sales experience to work with present accounts, develop new business and supervise salesmen.

Write Mr. J. S. Heuss, Personnel Manager, The Firestone Tire & Rubber Company, Akron, Ohio.

GRINDING FOREMAN. Midwest Foundry. State qualifications, references and salary. Address Box C-969, Care *The Iron Age*, 100 E. 42nd St., New York 17.

HELP WANTED

STEEL METALLURGIST WANTED

Metallurgical Engineer with practical experience, minimum of five years, familiar with Electric Furnace melting and heat treatment of steel, with thorough knowledge of metallography and laboratory operations.

ADDRESS BOX C-963
Care *The Iron Age*, 100 E. 42nd St., New York 17

SALES ENGINEER
Engineer, metallurgical or mechanical, age 30-45, for sales of fabricated steel products to open hearth plants. Should be familiar with furnace construction and operation. Fuel engineering or furnace operation background preferred. Pittsburgh district. Permanent position with nationally known company. Excellent chance for advancement. All replies held in strictest confidence. Send resume to:
BOX C-971
Care *The Iron Age*, 100 E. 42nd St., New York 17

HELP WANTED

PROMINENT DESIGNER

with experience in construction of cold rolling plants for broad strips. Details on required salary and earliest date of entering under No. 5637/55 to

DROSTE ANNONCEN-EXPEDITION
Düsseldorf, Germany

SITUATIONS WANTED

EXECUTIVE ENGINEER—44 Experienced manager in Environment Test Equipment; Refrigerators, Freezers—commercial and Domestic; Washing Machines; Ironers; and Dryers. Diversified in all phases of manufacturing and engineering in appliance and metal industries. Address Box C-968, Care *The Iron Age*, 100 E. 42nd St., New York 17.

FOR THE UNUSUAL IN
Seamless Steel Tubing...
1½" OD and smaller!
ELLWOOD IVINS STEEL TUBE WORKS INC.
700 VALLEY ROAD, PHILA. 26, PA.
ELLWOOD IVINS
WRITE . . . PHONE . . . WIRE!

To Lower your Overhead..
BROWNING ELECTRIC TRAVELING CRANES AND HOISTS
up to 125-TON CAPACITY
VICTOR R. BROWNING & CO., INC. WILLOUGHBY (Cleveland), OHIO

A. J. BOYNTON AND CO.
CONSULTING ENGINEERS
109 N. Wabash Ave., Chicago 2, Ill.

To Your SPECIFICATIONS
GRIFFIN
COLD ROLLED STRIP STEEL
SALES AGENTS:
WM. H. LEONORI & CO., Inc., 30 Howard St., New York 13, N. Y.; CHARLES L. LEWIS, 2450 17th St., San Francisco 10, Cal.; J. J. LAMBERT, 323 Huntington Ave., Buffalo, N. Y. CENTRAL STEEL & WIRE COMPANY, 13400 North Mt. Elliott, Detroit 12, Mich.; 3000 West 51st St., Chicago 80, Ill.; Box 148 Annex Station, Cincinnati 14, Ohio; JOHN E. LOVE, 2832 East Grand Blvd., Detroit 11, Michigan.
GRIFFIN MANUFACTURING CO. • ERIE, PA.

THE CLEVELAND STEEL TOOL Co.
Punches, Dies, Chisels, Rivet Sets
660 E. 82nd St., Cleveland, O.
If it's RIVETED you KNOW it's safe

Cutting off Machines for Sawing All Kinds of Metals
THE ESPEN-LUCAS MACHINE WORKS
FRONT AND GIRARD AVE., PHILADELPHIA, PENNA.

ADVERTISERS IN THIS ISSUE

An asterisk (*) beside the name of advertiser indicates that a booklet, or other information, is offered in the advertisement. Write to the manufacturers for your copies today.

A

Abbey Etna Co. 69
Aetna-Standard Engineering Co., The 74
Ajax Flexible Coupling Co., Inc. 116
*Allis-Chalmers Mfg. Co. 33
Allmetal Screw Products Co., Inc. 105
*American Chemical Paint Co. 50, 128
American Screw Co. 24, 105
American Steel Foundries, King Machine Tool Div. ... Back Cover
*American Wheelabrator & Equipment Corp. 148
Armco Steel Corp. 6
Armel, James P. 158
*Armstrong Bros. Tool Co. 161
Atlantic Screw Works, Inc. 105

B

Basic Refractories, Inc. Inside Front Cover
Belyea, Co., Inc. 157
Benkart Steel & Supply Co. 159
Bennett Machinery Co. 156
Bethlehem Steel Co. 1, 162
Blake & Johnson Co. 105
Bound Brook Oil-Less Bearing Co. 91
Boynton, A. J., & Co. 160
*Brainard Steel Div. Sharon Steel Corp. 99
Brownell, Hazard, Machine Tools, Inc. 156
Browning, Victor R., & Co., Inc. 160
Bucyrus-Erie Co. 17
*Burt Mfg. Co., The 108

C

*Cannon—Muskegon Corp. 13
Canton Drop Forging & Mfg. Co., The 161
*Carpenter Steel Co., The Alloy Tube Div. 22
Central Screw Co. 105
Chicago Electric Co. 157
*Cincinnati Bickford Tool Co., The 12
*Cincinnati Gilbert Machine Tool Co. 122
Cleveland Cap Screw Co., The .. 28
Cleveland Punch & Shear Works Co., The 118
Cleveland Steel Tool Co., The .. 160
Columbia Tool Steel Co. 92
Cone Automatic Machine Co., Inc. 54
Consolidated Railway Equipment Co. 158
Continental Screw Co. 105
Crawford, F. H., & Co., Inc. ... 156
Cross Company, The 10

D

*Dake Corporation 121
Delpark Industrial Filter 51
Detroit Power Screwdriver Co. .. 117
*DeVlieg Machine Co. 95
*Diamond Manufacturing Co. ... 161
Dodge Manufacturing Corp. 124
Donahue Steel Products Co. 155
Dony, D. E. Machinery Co. 156
Drais & Krump Mfg., Co. 127
Dubin Steel Company 158

E

Eagle Lock Co., The 105
Eastern Machine Screw Corp., The 161
Eastern Machinery Co., The 156
Elco Tool & Screw Corp. 105
Electric Equipment Co. 156
*Erie Foundry Co. 150
Espen-Lucas Machine Work:, The 160
Etna Abbey Co. 69

F

*Fairbanks, Morse & Co. 29
Falk Machinery Co. 156
Firestone Tire & Rubber Co., The 159
Foster, Frank B., Inc. 157
Frank, M. K. 158
*Fuller Company 149

G

Galland-Henning Mfg., Co. 151
*Gallmeyer & Livingston, Inc. .. 120
Garner, John G. 156
Goodman Electric Machinery Co. 158
Goss & DeLeeuw Machine Co. .. 161
Gray Iron Founders' Society, Inc. 114
Great Lakes Screw Corp. 105
Great Lakes Steel Corp. 53
Green Instrument Co. 11
Griffin Manufacturing Co. 160

H

*Hansen Manufacturing Co. 106
Harper, H. M. Co., The 105
Henry, A. T. & Company, Inc... 155
Houghton, E.F. & Co. 66
Hughes, Arnold Co. 158, 159
*Hydraulic Press Mfg. Co., The 70
Hyman, Joseph & Sons 155
Hyman-Michaels Co. 158

I

*Industrial Filtration Co. 51
Iron & Steel Products, Inc. 154
Ivins, Ellwood Steel Tube Wks. Inc. 160

J

*Jeffrey Mfg. Co., The 4
*Jones & Lamson Machine Co., Machine Tool Div. 18, 19
Jones & Laughlin Steel Corp. .. 48

K

Kasle Steel Corporation 150
*Kearney & Trecker Corp. 62
Klingelhofer Machine Tool Co. .. 129
Knox, Earl E. Co. 156

L

Lamson & Sessions Co., The 105
Land, L. J., Inc. 157
Lang Machinery Co. 156
Leeds & Northrup Co. Between pages 16, 17

ADVERTISERS IN THIS ISSUE

Leland-Gifford Co. 161
*Link-Belt Co. 30
*Lukens Steel Co. 113
Luria Bros. & Co., Inc. 135

M

McLouth Steel Corp. Between pages 16, 17
MacCabe, T. B., Co. 157
*Mahon, R. C. Co., The 23
Manhattan Rubber Div. Raybestos-Manhattan, Inc 147
*Marchant, Geo. F. Co. 128
Master Electric Co., The Inside Back Cover
*Maxwell Company, The 100
Meaker Co., The 94
Metal Blast, Inc. 153
Miles Machinery Co. 155
Mississippi Valley Equipment Co. 157
*Monsanto Chemical Co., Organic Chemicals Div. 103
Morrison Railway Supply Corp. ... 158
*Mueller Brass Company 31

N

*National Airoil Burner Co., Inc. 119
National Lock Co. 105
National Machinery Exchange .. 156
National Screw & Mfg. Co., The 105
National Steel Corp. 53
New Departure Div. General Motors Corp. ..... Front Cover

O

*Ohio Electric Mfg. Co., The ...137
Ohio Gear Co. 110
Ohio Seamless Tube Division of Copperweld Steel Co. 96
Ornitz Equipment Corp. 158
Osborn Mfg. Co., The 5
Ottemiller, Wm. H. Co. 127

P

Palmer-Shile Co. 101
Parker Kalon Div. General American Transportation Corporation 105
Pheoll Manufacturing Company.. 105
Pittsburgh Crushed Steel Co. ... 119
*Pittsburgh Plate Glass Co., Brush Div. 127
*Polyken Products Department of the Kendall Co. 107
Pope Machinery Corp. 112
*Portage Machine Co. 16
Purdy Company, The 157
Raybestos-Manhattan, Inc. Manhattan Rubber Div. 147
*Reliance Steel Div., Detroit Steel Corp. 109
Ren-Ite Plastics, Inc. 127
Republic Machinery Co. 156
*Republic Steel Corp. 14, 15
Revere Copper & Brass, Inc. 64
Rockford Screw Products Co. .. 105
*Rust-Oleum Corp. 25
Ryerson, Jos. T. & Son, Inc. 130

S

Scovill Mfg. Co. 105
Screw Research Assn. 105
Service Steel Div. Van Pelt Corp. 161
Shakeproof Div. of Illinois Tool Wks. 105
*Simmons Machine Tool Corp. .. 126
*Simonds Saw & Steel Co. 58
*Smith, A. O., Corporation....72, 73
Socony Mobile Oil Co., Inc. 8
*Somers Brass Co., Inc. 9
Southington Hdwe. Mfg. Co., The 105
*Spincraft, Inc. 115
Stamco, Inc. 161
Standard Iron & Steel Co. 158
Steel Shot Producers, Inc. 119
Sterling Bolt Company 105
Stone, R. J. 158
Stronghold Screw Prods., Inc. .. 105

T

Texas Company, The 56
Timken Roller Bearing Co., The .. 27
*Townsend Company, The 93
Tractor & Equipment Co. 158

U

*Udylite Corp., The 102
Ulbrich Stainless Steels 60
Universal Screw Company 105

V

Vanadium Corp. of America 159
*Vickers, Inc. 71

W

Wales-Beech Corp. 105
Wallack Bros. 159
Washington Steel Corp. 68
Waterbury-Farrel Foundry & Machine Co. 111
Weiss Steel Co., Inc 159
*Westinghouse Electric Corp. .. 20, 21
*Wheelock, Lovejoy & Co., Inc. .. 104
Wheland Co., The 34
Williams Machinery Company .. 155
*Wyandotte Chemicals Corp. .. 47

Y

Youngstown Sheet & Tube Co., The 26

CLASSIFIED SECTION

Business Opportunities 159
Clearing House 154, 158
Contract Manufacturing Appears in first and third issue of each month. See May 19 & June 2.
Employment Exchange 159
Wanted 159

STAINLESS STEEL
—PERFORATED—
TO YOUR REQUIREMENTS
SEND US YOUR DRAWING FOR PRICE
PERFORATED METALS
ALL SIZE AND SHAPE HOLES—ALL METALS
ARCHITECTURAL GRILLES
FOR ALL INDUSTRIAL USES
DIAMOND MFG. CO.
Box 41 Write for Catalog 39 WYOMING, PA.

LELAND-GIFFORD
the BIG NAME in DRILLING MACHINES
LELAND-GIFFORD COMPANY, WORCESTER, MASSACHUSETTS

ARMSTRONG Drop Forged
HOIST HOOKS
Correctly engineered, drop forged and heat treated. Strong—max. load is 4 times rated "safe work load"; elastic limit approximately twice rated load. Inside hook sizes from ¾" to 4". Capacities ½ to 25 tons. For safe dependable service . . . specify ARMSTRONG Hoist Hooks. Write for Catalog.
ARMSTRONG BROS. TOOL CO.
"The Tool Holder People"
5200 Armstrong Ave. Chicago 30, U. S. A.

for Corrugating and Complete Line of Culvert Equipment—Slitting and Coiling Equipment for Ferrous and Non-Ferrous Material in All Capacities—Warehouse and Steel Mill Cut to Length Lines for Shearing and Levelling Sheets from Coils—Shears for Shearing Sheets and Plates Both Underdriven and Overdriven Types in Capacities to 1¼" Plate.
STAMCO, Inc., New Bremen, Ohio

GOSS and DE LEEUW
MULTIPLE SPINDLE
CHUCKING MACHINES
Tool Rotating Type
GOSS & DE LEEUW MACHINE CO., KENSINGTON, CONN.

FORGINGS
ALL SIZES, pressed . . rolled . . extruded . . forged to accurate specifications from carbon, alloy, stainless steels and special metals. Modern metallurgical, die, heat-treating and rough machining facilities.
Over 50 years of forging design and development
THE CANTON DROP FORGING & MFG. CO.
CANTON, OHIO

H&G Insert Chaser DIE HEADS
famous for accuracy and straightness of threads, low chaser costs, less downtime, more pieces per day.

THE EASTERN MACHINE SCREW CORP., 21-41 Barclay Street, New Haven, Conn.
Pacific Coast Representative: A. C. Berbringer, 334 N. San Pedro St., Los Angeles, California Canada: P. P. Barber Machinery Co., Toronto, Canada

STEEL TUBING
SEAMLESS or WELDED
AIRCRAFT - MECHANICAL
PRESSURE - STAINLESS
SERVICE STEEL
STAINLESS PIPE & FITTINGS
DETROIT - BUFFALO - CHICAGO - CINCINNATI - LOS ANGELES

This is the tenth of a series of advertisements dealing with basic facts about alloy steels. Though much of the information is elementary, we believe it will be of interest to many in this field, including men of broad experience who may find it useful to review fundamentals from time to time.

Chromium and Its Effects in Alloy Steels

As previously pointed out in this series, the elements that together make up an alloy steel work both singly and collectively. In a sense they are like the components of a machine, each having its job to do, yet each working with other components to achieve an overall result.

An earlier discussion was devoted to the functions of nickel. In this one we shall outline briefly some of the purposes of chromium, another of the fundamental alloying elements.

Chromium is a versatile agent. Among other things, it fosters depth-hardenability, improves surface resistance to abrasion and wear, and promotes carburization. Of the common alloying elements, chromium ranks near the top in hardenability. This property tends to make high-chromium steels relatively air-hardening; hence it is valuable in applications where, for one reason or another, liquid quenches are undesirable.

Chromium steels are relatively stable at high temperatures and are often used where resistance to heat is important. Moreover, the presence of chromium is a vital factor in helping to retard or prevent corrosion.

The uses of chromium steels are many and varied. Among the more familiar items that often contain chromium are hand tools, gears, springs, turbine wheels, ball and roller bearings, forged shafts and rotors, etc. There are of course numerous others; virtually no list would be all-inclusive.

One of the most useful of the alloys, chromium has been the subject of long study by Bethlehem metallurgists. These technicians have a thorough working knowledge of its effects in various types of analyses. Whenever you have a problem involving chromium steels, or would like to know more about the subject in general, by all means communicate with the Bethlehem staff. Our men will come to your office or plant at any time. You will find them co-operative and helpful.

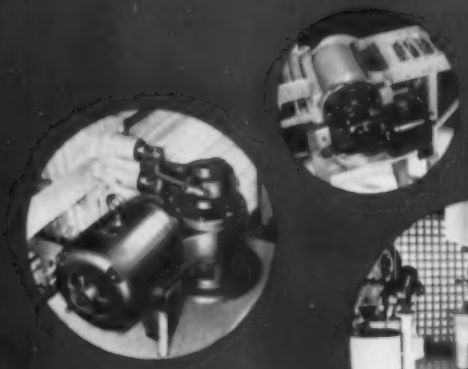
And please remember, too, that Bethlehem makes the full line of AISI standard steels, as well as special-analysis steels and all carbon grades. Your inquiries will receive our most careful attention.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL



What do you need in your electric motor drives . . . gear reduction . . . electric brakes . . . variable speed operation . . . fluid drive . . . special mountings or does a standard motor (like the 200 HP synchronous motor shown below) best suit your needs? Whatever it is, check with Master first. We offer you the widest selection of electric motor drives in the nation.

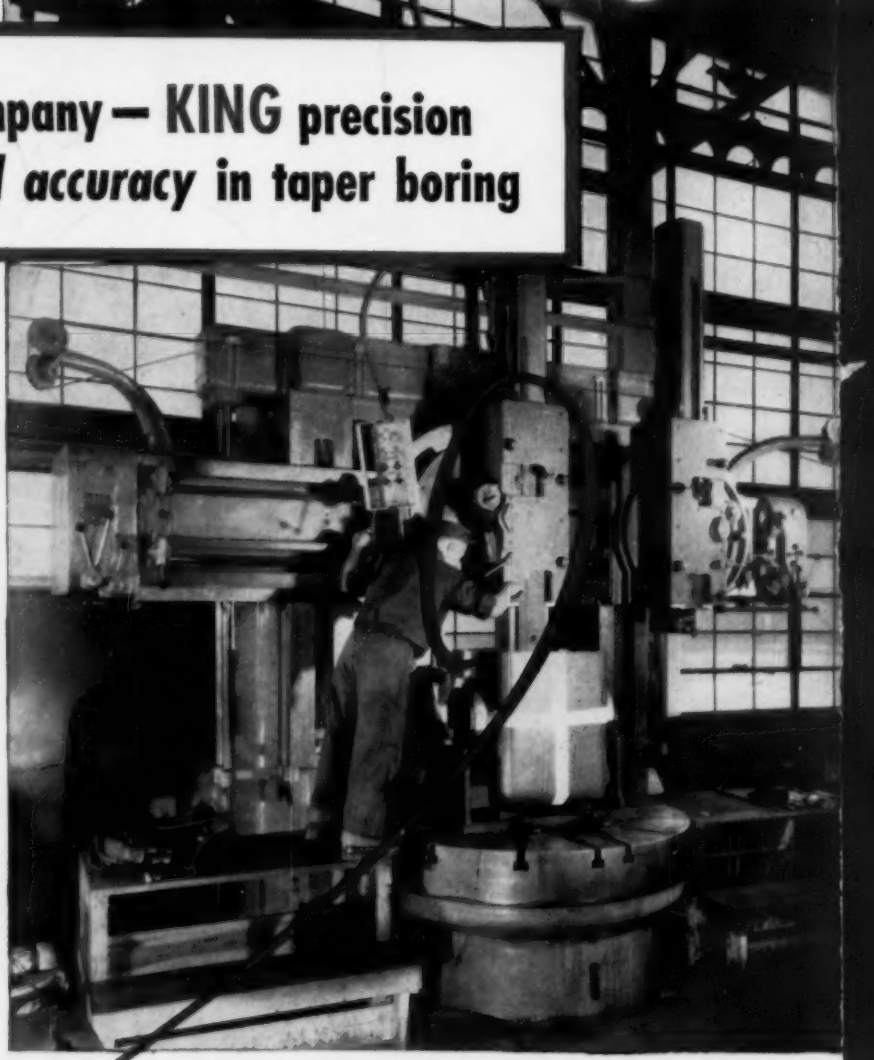
In thousands and thousands of ratings, ⅛ to 400 horsepower . . . in open, enclosed, splash proof, fan cooled, explosion proof . . . horizontal or vertical . . . for all phases, voltages and frequencies . . . in single speed, multi-speed and variable speed types . . . with or without flanges or other special features . . . with 5 types of gear reduction up to 430 to 1 ratio . . . with either magnetic or dynamic type electric brakes . . . with fluid-drive . . . with mechanical or electronic variable speed units . . . and for every type of mounting . . . Master has them all and so can be completely impartial in helping you select the one best power drive for you.

THE MASTER ELECTRIC COMPANY • DAYTON 1, OHIO

it's easy to get the right results

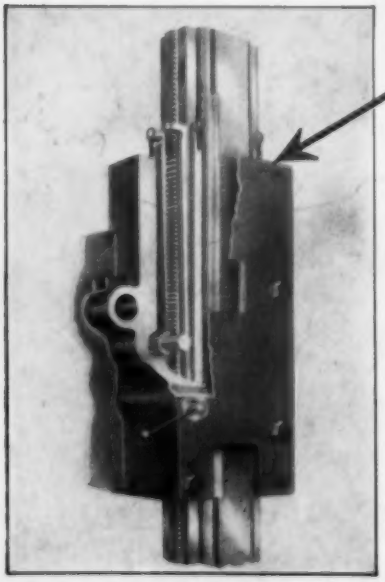
MASTER ELECTRIC MOTORS

At The Oilgear Company — KING precision assures *exceptional accuracy* in taper boring

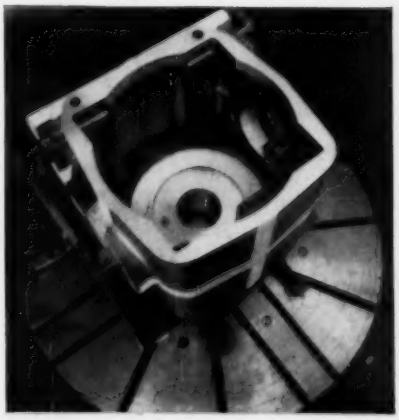


For the Oilgear Company, Milwaukee, Wisc., the 62″ King® Vertical Boring & Turning Machine, shown at right, precision-machines castings for high pressure pumps. An example of the extreme accuracy obtained is the taper boring, in Class 50 gray iron, of 7″ diameter x 8″ deep holes to .005″ per inch of taper, while holding .001″ tolerance on the diameter for the entire depth of the hole. A finish better than 125 micro-inches is maintained. On other boring, facing, and turning work—on parts for cases, end covers, rotors, etc., for 60, 100, and 150 hp. Oilgear Pumps—similar dimensional precision and fine finish are obtained.

Here again is on-the-job *proof* of how King superior design, massive proportions, and extra-rigid construction provide the ability to cut costs and improve quality on the complete range of boring, facing, and turning work. King machines are made in ten sizes, from 30″ to 144″. For full information see your King Distributor, or write us.



Cut-away drawing of rail head, at left, illustrates how extra rigidity is built into King machines, assuring an unvarying accuracy that makes possible fine-dimension tapering and other operations such as those described by the Oilgear Company . . . Drawing shows construction of support and guiding of the ram in its relation to the swivel. There are eight bearing surfaces, two on each side of the rectangular ram. Adjustment to these surfaces is obtained with the use of four gibs, two on the front and two on the side. To overcome any spreading of the guiding surfaces of the ram, a plate the full length of the swivel is tongued, as shown. Accurate guiding surfaces are thus maintained at all times.



Close-up view of the work being machined above. Note the fine finish (better than 125 micro-inches) obtained on the facing work and in the tapered bore, as a result of King built-in precision features.

VISIT US AT MACHINE TOOL SHOW — CHICAGO, SEPT. 6-17 — BOOTH 1121

KING AMERICAN STEEL FOUNDRIES • KING MACHINE TOOL DIVISION
1150 Tennessee Avenue . . . Cincinnati 29, Ohio
VERTICAL BORING & TURNING MACHINES